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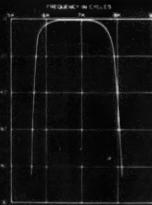
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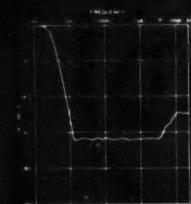
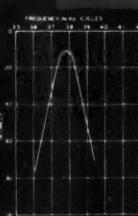
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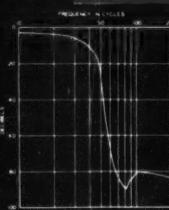
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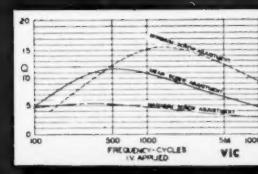
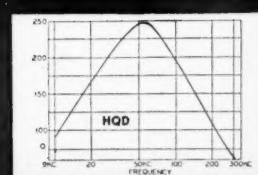
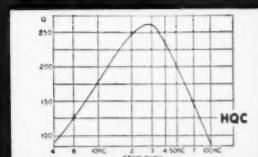
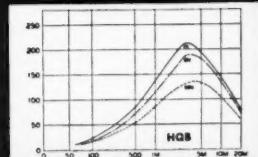
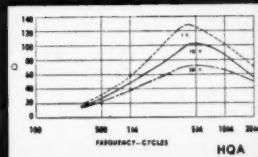
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- 1930 — Magnetron made commercially available.
- 1935 — Centimeter waves used to measure speed and direction of aircraft.
- 1936 — Velocity-modulation tube developed.
- 1940 — Disk triode developed.
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JULY 1952

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INDEXED BY
INDUSTRIAL ARTS INDEX

-CONTENTS-

TECHNICAL —

A High-Powered Driver-Amplifier for 144 Mc.	E. P. Tilton, WIHDQ	11
The Siamese Paddle.....	Myron Hexter, W9FKC	16
A Phase-Angle Detector for R.F. Transmission Lines	G. Robert Mezger, W2BLL	17
Two-Element Driven Arrays.....	L. A. Moxon, G6XN	28
Antenna-Mast Loading and Guying	Charles Kandel, W2VOU	42
Constructing Safety Interlocks from Standard Parts	Ronald L. Ives	45
Simple VFO Construction for the 75-Meter 'Phone Band	Charles McDowell, W4JJX	46
A 200-Watter for 160..	Robert M. Resconsin, W1TRF	48
Technical Topics — "How Come No 160?"		60

MOBILE —

A Quadriband Mobile Transmitter	Charles J. Schauers, W6QLV	24
---------------------------------	----------------------------	----

NOVICE —

Getting the Most Into Your Antenna	Richard M. Smith, W1FTX	21
------------------------------------	-------------------------	----

OPERATING —

Recap — DX Contest High Claimed C.W. Scores.....	64
--	----

GENERAL —

Arkansas-Tennessee Tornadoes..	George Hart, WINJM	51
--------------------------------	--------------------	----

ARRL Articles of Association and By-Laws.....	54
---	----

"It Seems to Us . . ."	9	The World Above 50 Mc.....	61
Quist Quiz.....	10	United States Naval Reserve...	64
Hamfest Calendar.....	10	How's DX?.....	65
Feed-back.....	10	Hints & Kinks.....	68
Silent Keys.....	20	Correspondence from Members.	69
Happenings of the Month.....	32	Operating News.....	70
YL News and Views.....	39	With the AREC.....	72
On the Air with Single Sideband	40	Station Activities.....	76
In QST 25 Years Ago.....	60		

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio Club reports are also desired by SCMs for inclusion in OST. **All ARRL Field Organization appointments are now available to League members.** These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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"It Seems to Us..."



NEW CHARTER AND BY-LAWS

When the American Radio Relay League resumed activity at the close of World War I, it was operating under a constitution which provided for the government of our affairs by a Board of seventeen directors elected by the membership. But every member of the Board was a director-at-large, elected by popular vote of the entire membership and usually nominated by the Board itself; five of the directors thus elected were also paid officers on the Hq. staff. As the League grew our leaders foresaw the desirability of more democratic government which would provide for regional representation, with each director elected by and responsible to the membership in his particular region or division. This was a cause largely championed by the late Kenneth B. Warner. On December 18, 1923, the Board adopted a new Constitution & By-Laws, drafted by Warner and the Executive Committee to accomplish the desired ends, and the Board in effect voted itself out of office to be replaced by new men nominated and elected by each division.

The 1923 Constitution and By-Laws has served the League, and well, for nearly thirty years. But over that period many minor changes were made here and there by the Board to remedy particular situations—changes in the mechanics and dates of elections, filling of director vacancies, eligibility requirements and interpretations, etc. Although the fundamental principles remained constant, the effect was to build on the sound structure a series of "cupolas" which eventually became confusing and in some cases actually conflicting, were not properly by-laws of a corporation in others, etc. At its 1950 meeting the Board set up a Constitution Revision Committee to study the problem; the Committee, with the assistance of the General Counsel, did its job well—so well in fact that the Board at its 1951 meeting adopted the draft of new Articles of Association almost without change, and at its meeting just held in May completed the job by adopting, effective July 1, 1952, the draft of new By-Laws and supplementary regulations also almost without amendment.

The basic concept of the League's structure

and government remains unchanged. Those principles which are unchanging are embodied in the Articles of Association—the purposes of the ARRL as a non-profit membership association, the government of our affairs by a Board elected by members to represent their divisions, the authority of the Executive Committee (which now includes one director) in the intervals between Board meetings, the barring of membership on the Board to those with commercial interests, and the like. In the By-Laws are those provisions which may need change from time to time to meet our future needs—divisional boundaries, the mechanics of elections, dues rates, meeting dates, standing committees, etc. Supplementary rules and regulations state League policy in matters of conventions and affiliated clubs, and now in process of formation are rules and regulations governing the Communications Department.

Beginning on page 54 of this issue we publish in their entirety the texts of the new instruments of government of your League. They merit your careful reading.

NOVICE PROMOTION

Do you have a friend or acquaintance you're trying to interest in ham radio, but you can't get the bug to bite quite deeply enough? Precisely the push he needs may be furnished by a new promotional booklet the League has just produced, entitled "*You Can Be There.*"

In two colors, and pocket-size for ease in handling and distribution, the booklet points up the Novice Class license not only for the enjoyment of two-way radio communications but also as a stepping-stone to a professional electronics career in industry or military service. Part of the promotional campaign undertaken at the instructions of the Board of Directors, it has had a first printing of 100,000 copies which are currently being distributed in quantities through youth organizations, civic and educational groups, and through electronics manufacturers and distributors.

We call it to your attention not only as information but also so that you may make use of it in your own activities if desired. Should you be promoting amateur radio in a local Boy Scout troop, for example, we'll be glad to send you sufficient copies for individual distribu-

tion. Should you be giving a talk on amateur radio before civic clubs and the like, you might want copies to distribute afterwards to interested members of the audience. Perhaps you will want to contact science instructors in the local schools to see if classes or after-hour clubs would be suitable recipients. Though too expensive to be left in quantity on a public counter as "throw-aways," we'll gladly furnish any reasonable number of copies you request provided you indicate how the booklets are to be used.

We think the booklet does a pretty good job of creating an initial interest in amateur radio on the part of casual readers, and will help accomplish the aim of attracting numbers of new people into our game through the Novice license.

FEED-BACK

In W6OWP's article, "A Beat-Frequency Extender for Better C.W. Signals," in the June issue, L_1 in the caption under Fig. 1 on page 12 should have a diameter of $\frac{3}{8}$ inch instead of $\frac{1}{8}$ inch. Last-minute revisions in the circuit of Fig. 2 on page 13 conspired to scramble the capacitance values. The caption should read as follows: $C_1, C_2 = 100-\mu\text{fd}$. trimmer; $C_3, C_6, C_7, C_8 = 0.01-\mu\text{fd}$. disk ceramic; $C_4 = 0.1-\mu\text{fd}$. 600-volt paper; $C_5 = 100-\mu\text{fd}$. mica; $C_9 = 100-\mu\text{fd}$. variable.



A tested his 'phone transmitter with a 100-watt lamp used as a dummy load, and observed that the brilliancy of the lamp increased as he spoke. This is proper, he reasoned, because the total output power increases with modulation. However, he notices that the S meter on his receiver stands still on any 'phone signal except those where controlled carrier is used, and he reasons that the S meter should kick up with modulation just as the lamp does, if the S meter is an indication of the power of the received signal. B tells him that the S meter doesn't kick up because it is in a circuit with a long time constant and consequently can't kick up except under sustained modulation. Who is right?

(Please turn to page 110 for the answer)

COMING A.R.R.L. CONVENTIONS

- | | |
|---------------|---|
| July 4th-6th | — Pacific Division, San Francisco, Calif. |
| Sept. 5th-7th | — Dakota Division, Minneapolis, Minn. |
| Sept. 11th | — Vermont State, Burlington, Vt. |
| Sept. 27th | — New Hampshire State, Nashua, N.H. |
| Oct. 3rd-5th | — Hudson Division, Albany, N.Y. |
| Oct. 11th | — Roanoke Division, Richmond, Va. |

HAMFEST CALENDAR

ALASKA — Saturday and Sunday, August 2nd and 3rd, at Copper Center Roadhouse, Fairbanks — the All-Alaska Hamfest. Plenty of mobile activity is expected, and a special calling frequency of 3892 kc. has been established for the Hamfest. For further details contact KL7NT.

ARKANSAS — Sunday, July 13th, at Lake Conway, 8 miles south of Conway on U. S. Highway 65 — an Arkansas hamfest sponsored by the Conway Amateur Radio League. The hamfest will be picnic style, and officials of CAP will be on hand to discuss communications in the CAP. For further details, write to WN5TIC, 340 Davis St., Conway.

CALIFORNIA — Saturday, August 9th, at Wieland's Brewery, San Jose — the third annual Central California Barbecue, sponsored by the Santa Clara County Amateur Radio Association. Festivities start at 3 p.m., with dancing at 8 p.m. Registration fee is \$3.00, with a chance at a mobile converter for those who register prior to August 3rd. Make registrations to SCCARA, P. O. Box 663, San Jose.

IDAHO — Friday, Saturday and Sunday, Aug. 2nd, 3rd and 4th, the annual meeting of the WIMU and convention at Big Springs, Idaho. This is the annual get-together of the amateurs in Wyoming, Idaho, Montana, and Utah. A full program is planned, and adequate accommodations are available at dude ranches, lodges and inns. The site of the meeting is near Yellowstone Park, so fit it into your vacation plans. For further information write to Mrs. R. Earl Dawes, Box 663, Bozeman, Montana.

ILLINOIS — Friday, July 4th, at the clubhouse grounds of the Egyptian Radio Club — the Annual Picnic and Hamboree. The club grounds are located one block south of new Chain of Rocks Canal Bridge on highway 66 between Mitchell, Ill., and the Mississippi river. No admission charge. Food and drinks available. Contests and awards.

ILLINOIS — Sunday, August 10th, at Frankfort Park (on U. S. Rt. 45, one-half mile north of U. S. 30) — the Eighteenth Annual Picnic of the Hamfesters Radio Club, advertised as the friendliest get-together in the west. Food, ice cream and beverages available. Treasure hunt and games for the kiddies. Prize table Hamfesters style. For tickets write J. J. Ruth, W9GVQ, 4460 Oakenwald Ave., Chicago 15, Ill. Donations \$1.50.

INDIANA — Sunday, July 31st, at Brookside Park in Indianapolis — picnic of the Indiana Radio Club Council sponsored by the Indianapolis Radio Club. \$1.00 registration, with games and awards for young and old.

MAINE — Saturday, July 26th, at the Eastland Hotel in Portland — the Fourth Annual Down East Hamfest. Registration will start at 11:00 A.M., with the banquet at 6:30 P.M. The registration fee is \$4.50, and advance reservations should be made with Lee Johnson, W1QIQ, 92 William St., Portland.

MICHIGAN — Sunday, July 27th, at Kensington State Park, 20 miles Northwest of Detroit, near Milford — the second annual picnic of the Inter-County Amateur Radio Club. There will be swimming, games and transmitter hunt, special awards for the ladies and children. A Johnson Viking wired, tested and complete with tubes, will be among the many valuable items awarded. Tickets are \$1.00 each. Bring your lunch and come early. Get your tickets at the picnic or write to W8HYM, 17303 Lenore, Detroit 19, Mich.

VIRGINIA — Sunday, Aug. 3rd, at the Dickey Ridge picnic grounds on the Skyline Drive, near the Front Royal entrance — the second annual hamfest of the Shenandoah Valley Amateur Radio Club. Registration is \$1.00, with a fried chicken dinner available for an extra \$1.25. There will be plenty of activities and awards, and all registrations should be made prior to July 25th. Write the Shenandoah Valley Amateur Radio Club, P. O. Box 139, Winchester, Va.

WYOMING — Saturday and Sunday, July 19th and 20th, at South Fork Camp on Powder River in the Big Horn Mountains — the Annual Wyoming Hamfest for 1952, sponsored by the Casper Radio Amateur Club. The only charge will be for the banquet and lodging. For further details, write to Lial D. Branson, W7AMU, 342 South Elk St., Casper, Wyoming.

A High-Powered Driver-Amplifier for 144 Mc.

An All-Tetrode Transmitter Design for the V.H.F. Enthusiast

BY EDWARD P. TILTON,* WIHDQ

In the course of the TVI program currently underway in the Headquarters Lab, there arose a need for a 2-meter rig that would be capable of generating something approaching the legal limit of power, to check overload characteristics of representative TV receivers. More than two years' experience with the 450-watt rig at W1HDQ¹ had shown it to be substantially free of TVI on 144 Mc. when operated in the presence of a usable TV signal from our semi-local Channel 6 station. Would jacking the power by another 3 db. make any difference? The 144-Mc. powerhouse shown here was built to find out.

Many hours of tests at up to 800 watts input have shown that it doesn't; that, if reasonable precautions are taken in design and construction, TVI problems are not greatly complicated by the use of high power in the 2-meter station, so long as the rig is not amplitude-modulated. Even with a.m., TVI potentialities do not go up with power as rapidly as one might think. The crux of the matter seems to be that 2-meter TVI is caused not by the 144-Mc. r.f., but by harmonics of lower-frequency stages that fall in the TV channels, and by audio circuit pick-up closely akin to the midget-receiver BCI that has been with us for years. There are high-band image problems in some older receivers, and occasional beats with other frequencies in use locally, but in our experience with current production receivers we've found little evidence of r.f. interference from pure 144-Mc. radiation, even with several hundred watts in a horizontally-polarized

array just a very few feet from the TV antenna.

In most 2-meter work few of us need or even desire really high power. We seldom have to beat down others on the same frequency, but there are times when it's nice to be able to pour it on. In aurora DX work, for example, it has been almost universally true that the high-powered stations work the choice stuff.

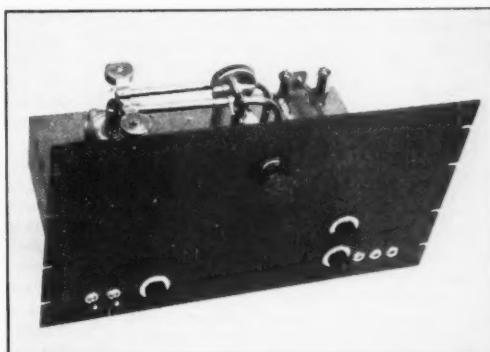
If facilities are not available for modulating the full power capabilities of the rig, input can be dropped to 200 watts or less with little change in efficiency. Just because the transmitter is capable of close to a kilowatt input is no reason that it must be run that way. And if we've been in the habit of straining to get the utmost out of 2-meter gear by running it almost to the limit of endurance (and sometimes beyond!), it is comforting to be able to generate a sizable signal with everything running well below its ratings.

Three push-pull stages are used, beginning with a pair of RCA 5763s which triple from 48 to 144 Mc. If a 2-meter rig capable of putting out 5 to 10 watts is already available, this stage can be omitted, and only the two 144-Mc. stages built into the assembly. The first is a dual-tetrode amplifier using an Amperex AX-9903. With some modification of the circuits, an 829B might be used, but the lower input and output capacitance of the 9903 make it preferable. An 832A may be used interchangeably with the 9903, but care is necessary to avoid exceeding its ratings; so the larger tube is recommended. The final stage uses a pair of Eimac 4-125As, with a low-C tank circuit made of copper tubing. The manufacturer's ratings allow slightly over 600 watts input on plate-modulated 'phone and 800 watts on c.w. at 150 Mc.

* V.H.F. Editor, QST.

¹ Chambers, "450 Watts on V.H.F.," QST, September, 1949, p. 22. Also ARRL Handbook, 27th, 28th, and 29th editions.

Panel view of the high-powered 2-meter transmitter. At the bottom left are the filament switches and the knob for the screen-neutralizing adjustment. The two knobs, lower right, are the tripler and driver plate tuning, ganged, and the antenna coupling adjustment. Jacks in the tripler-grid, driver-grid and driver-cathode circuits are at the far right. The large knob at the upper center is for turning the plate tuning capacitor.



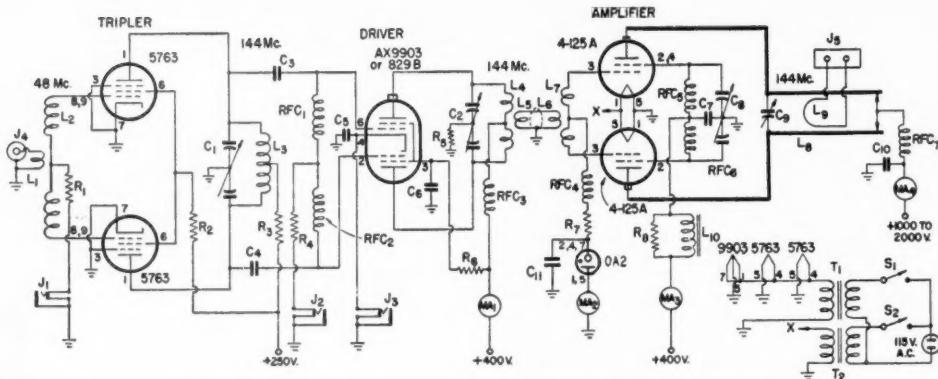


Fig. 1 — Wiring diagram and parts list for the high-powered 144-Mc. transmitter.

C₁, C₂ — 10- μ fd.-per-section butterfly variable (Cardwell ER-6-BF/S, Johnson 10LB15 alternate; see text).

C₃, C₄ — 10- μ fd. mica.

C₅, C₆ — 0.001- μ fd. disk ceramic.

C₇ — 0.005- μ fd. disk ceramic.

C₈ — 50- μ fd.-per-section split-stator variable (made from Millen 19140; see text).

C₉ — Plate-line tuning adjustment (made from neutralizing condenser; see text).

C₁₀ — 0.001- μ fd. 5000-volt mica.

C₁₁ — 0.25- μ fd. tubular.

R₁ — 150,000 ohms, 1 watt.

R₂ — 18,000 ohms, 1 watt.

R₃ — 100 ohms, $\frac{1}{2}$ watt.

R₄ — 10,000 ohms, 1 watt.

R₅ — 100 ohms, 1 watt.

R₆ — 10,000 ohms, 10 watts.

R₇ — 5000 ohms, 10 watts.

R₈ — 27,000 ohms. Use only if needed; see text.

L₁ — 1 turn No. 14 enam., $\frac{3}{4}$ -inch diam.

L₂ — 6 turns each side of center, No. 20, $\frac{5}{8}$ -inch diam., spaced wire diam., $\frac{1}{4}$ -inch space at center for L₁ (B & W Miniductor No. 3007).

L₃ — 2 turns No. 14 enam., spaced $\frac{1}{8}$ inch, $\frac{1}{2}$ -inch diam.

L₄ — 2 turns No. 14 enam., spaced $\frac{3}{8}$ inch, $1\frac{3}{8}$ -inch diam.

Electrical and Mechanical Features

The exciter needed to drive the tripler is not shown, as plans call for a general-purpose v.h.f. exciter to be built later. For the present, a small 50-Mc. unit described in the 1952 ARRL Handbook² is being used, but almost anything capable of 3 to 5 watts output on 48 Mc. should serve. If the exciter has no stages operating lower in frequency than 24 Mc., a prolific source of TVI in the form of unwanted harmonics can be eliminated.

The tripler circuit is extremely simple, but it supplies the necessary drive for the 9903 amplifier with ease. The plate circuits of these two stages are gang-tuned. They may not track accurately over large frequency changes, but the 2-meter operator seldom jumps around the band extensively, and if a major change is required, the inductances can be altered by spreading or squeezing the turns to take care of tracking. By slight rearrangement of parts the tripler could be tuned by a separate control. Straps of flashing

L₅ — 2 turns No. 18 push-back, close-spaced, inserted between turns of L₄.

L₆ — Loop of No. 14 enam., 4 inches long, inside L₇.

L₇ — Copper strap $\frac{5}{16}$ inch wide and 8 inches overall from grid to grid; see text and bottom-view photograph.

L₈ — Plate line, $\frac{3}{8}$ -inch o.d. copper tubing 12 inches long, spaced $1\frac{3}{8}$ inches center-to-center. Bend on 1-inch radius to make inverted "T" $4\frac{1}{2}$ inches high.

L₉ — Output coupling loop, made from $1\frac{1}{2}$ -inch piece of No. 14 enam. Sides $\frac{1}{4}$ inch spaced. Vertical portion $2\frac{1}{2}$ inches high.

L₁₀ — 5-hy. (min.) choke, 100 ma. or more rating.

J₁, J₂, J₃ — Closed-circuit jack.

J₄ — Coaxial fitting.

J₅ — Crystal socket for output terminal.

MA₁, MA₂, MA₃, MA₄ — External meters, not shown in photographs, 200, 50, 100 and 500 ma., respectively.

RFC₁, RFC₂, RFC₃, RFC₄, RFC₅ — 1.8- μ hy. solenoid v.h.f. choke (Ohmite Z-144).

RFC₆, RFC₇ — 7- μ hy. solenoid v.h.f. choke (Ohmite Z-50).

S₁, S₂ — S.p.s.t. toggle switch.

T₁ — 6.3-volt 4-amp. filament transformer.

T₂ — 5-volt 13-amp. filament transformer (Chicago FO-513).

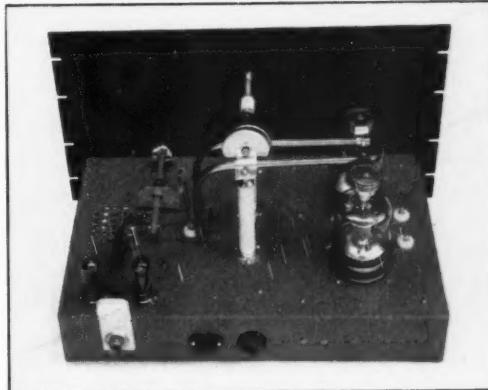
copper $\frac{5}{16}$ inch wide are used for the leads from the 5763 plates to the stator terminals of C₁, to hold down lead inductance.

It will be noted from the bottom view that copper sheets are mounted on the bottom surface of the chassis covering the area of the driver and final stages, to improve grounding conductivity. Only one other element of novelty appears in the driver stage: the grounding of the rotor of C₂ through a 100-ohm resistor, R₅. Originally this butterfly capacitor was mounted on an aluminum bracket, grounding the rotor directly, but the resistor was substituted to stop a 250-Mc. parasitic oscillation. The rotor is now mounted on a polystyrene plate. The rotor of C₁ is grounded directly to the aluminum bracket that also serves as a mounting for the 9903 socket. Note that ventilation holes are drilled through the copper plate and chassis just above the driver tube.

Plate leads for the 9903 should be very pliable material, silver or copper ribbon preferred to braid. The glass seal around the plate pins is fragile, so there should be no mechanical strain.

²ARRL Handbook, 29th edition, p. 402.

Rear view of the 4-125A amplifier for 144 Mc., showing details of the parallel-line plate circuit. The 5763 tripler tubes are at the left. Note ventilation holes, below which is mounted the driver tube, out of sight under the chassis.



Standard heat-dissipating connectors must be filed down by about one-third of their total diameter, because of the close pin spacing on the 9903. Cardwell butterfly capacitors were selected for C_1 and C_2 because of their provision for ganging. Should these not be available, other types including the Johnson 10LB15 can be substituted by soldering a ganging extension on the rear end of the rotor shaft of C_2 .

Mounting the driver-plate and final-grid circuits so as to permit direct inductive coupling was ruled out in favor of separated circuits and link coupling, as shown. This reduces capacity coupling and makes the transferring of unwanted harmonics to the amplifier less likely. With low-drive tetrodes, even a small amount of energy (such as the 9th harmonic of a 6-Mc. crystal or the 8th harmonic of a 24-Mc. stage, examples of TVI possibilities in Channels 2 and 9 or 10) can be passed on and amplified if there is appreciable capacity coupling. This precaution can be carried further by providing link coupling between the tripler-plate and driver-grid circuits, and if Channels 9 or 10 are in use in the builder's locality this might be a desirable procedure.

The final stage has several novel features. The relatively high input and output capacitances of the 4-125As rule out conventional coil-and-condenser circuits at 144 Mc., so no grid tuning capacitor is used, and only a very small variable capacitance is used across the plate line. The entire grid circuit is made of $\frac{3}{16}$ -inch copper strip. Two pieces $1\frac{1}{2}$ inches long connect the grid terminals to feed-through bushings that are provided for neutralizing tabs, if needed. The center portion is an egg-shaped loop also mounted on the feed-throughs, as seen in the bottom view. The bushings are mounted near the inner corners of the tube sockets, in holes that are drilled larger than needed to pass the ceramic portions of the bushings, to keep grid-to-ground capacitance to a minimum. More about these later.

The most critical neutralizing adjustment is provided by the variable screen-to-ground capacitor C_8 , a split-stator variable the rotor of which is grounded through a metal mounting

pillar between the two sockets. A modified single-section unit was used because its construction assured a symmetrical path from rotor to ground for each half of the assembly. It can be made from any of several standard single-section variables having ceramic supports at both ends.

A strap of brass or aluminum is first screwed to the metal mounting brackets at each end, tying them together electrically and mechanically. Then the stator bars are sawed in half, leaving an equal number of plates on each side. A Millen double-end-plate variable (19140) was used, but $100-\mu\text{fd}$. models would serve equally well, as the required neutralizing capacitance turned out to be about $30 \mu\text{fd}$. on each side. The 19140 had 9 plates each on the stator and rotor originally. The middle stator plate was cut out, and the front-end rotor plate removed, leaving a split-stator condenser with 4 plates on each stator and 8 on the rotor. The two screen terminals on each socket are strapped together, and connection to the stators is made with copper strap. Symmetry and low inductance are extremely important here.

The screen circuit also includes two solenoid-type r.f. chokes connected directly to the screen terminals. These are under C_8 and do not show in the photograph. Their common connection is by-passed, and a small filter choke is inserted in the screen-voltage lead for modulation purposes. The screen variable capacitor is driven through two universal-joint couplings to bring the drive shaft and knob out to a position that provides a balanced front panel appearance.

At first the amplifier was operated with resistor bias only, but this had certain disadvantages. There was a tendency to hum around the operating frequency during stand-by periods, and there was no means of cutting off the final plate and screen current when excitation was removed. Fixed bias is provided without the use of batteries or an external bias supply by inserting a voltage-regulator tube in series with the grid leak and bypassing the tube with a low-leakage capacitor. When the gas tube fires with application of excitation, C_{11} charges. Removing the excitation stops

the current flow through the VR tube and leaves the charge in C_{11} applied to the 4-125A grids. This is sufficient to cut off the plate and screen current until the capacitor discharges. The length of the cut-off period depends on the leakage characteristics of C_{11} and associated wiring. With an ordinary 0.25- μ fd. paper tubular, there is no plate and screen current for a minute or more. A 1- μ fd. transmitting-type condenser kept the amplifier cut off for several minutes. Some experimentation with C_{11} may be necessary, and there must be very low d.c. leakage losses in the entire grid-to-ground circuit. An external bias source of 90 volts or more may, of course, be substituted.

The construction of the final plate circuit is obvious from the top-view photograph. The tuning device, C_9 , is made from parts of a standard neutralizing capacitor (Millen 15011) mounted on 4-inch ceramic stand-offs (National GS-4) in the center of the chassis. The lead screw on the adjustable plate is extended by means of a short length of $\frac{1}{4}$ -inch diameter brass rod soldered to its end, and this is connected through an insulating coupling and a polystyrene rod to a knob on the front panel. This tuning arrangement provides no logging scale or reset indicator of any sort, but it results in a very worth-while improvement in tank-circuit efficiency over conventional tuning methods.

The copper tubing tank circuit is mounted in place by means of straps of aluminum wrapped around the lines and fastened to the top of the stand-offs. Connection to the tube plates is made with $\frac{3}{4}$ -inch-wide copper straps that are bolted to the plate lines. No solder is used anywhere in this plate line assembly; the heat dissipated at the tube end of the line would be sufficient to melt soldered connections. The heat-dissipating connectors for the 4-125A plates were cut down to four fins high to reduce plate lead length. Just beyond the stand-off insulators and C_9 the plate lines are bent to a vertical position around a radius of about one inch, the bottom of the line ending about a half inch above the chassis. Here an adjustable strap of flashing copper is wrapped around the lines, and an r.f. choke is connected through a lug to a feed-through bushing carrying the high-voltage d.c.

Details of the antenna coupling loop are visible in the top view. The pick-up loop is made adjustable by mounting it through a polystyrene rod that can be rotated from the front panel. This rod passes through a shaft bearing and a tension adjusting device (National SB and Millen 10061) mounted on a small aluminum bracket. Note that a short length of rod is fastened at the top of the loop, so that no adjustment of the coupling will allow it to come in contact with the line electrically.

Adjustment and Operation

This rig contains its own filament transformer so only plate and screen supplies are external. These should be capable of furnishing 250 volts at 75 ma. for the tripler, 400 volts at 200 ma. for

the driver, 300 to 400 volts at 75 ma. for the final screens, and 1000 to 2000 volts at 400 ma. for the amplifier plates. The screens of the final and the driver plates may be run from the same supply, though a more flexible set-up is possible if the voltage applied to the final screens is adjustable separately.

The tripler should be tuned up first. Plug a low-range milliammeter in the tripler grid current jack, J_1 , and apply grid drive through a coaxial cable and J_4 . Adjust the spacing between the two halves of the grid coil, L_2 , and the position of L_1 , for maximum grid current. This should be 1 to 2 ma. Transfer the meter to the driver grid jack, J_2 , and apply plate voltage through R_3 , tuning C_1 for maximum grid current, which should be between 3 and 5 ma. The inductance of L_3 should be adjusted so that the low end of the band is reached with C_1 set somewhere between the mid-point and the maximum end of its range. Total plate-screen current to the 5763s need not be more than about 50 ma.

Next, tune C_2 through resonance and note whether the grid current changes. Should it dip down at resonance the stage will require neutralization.

This is unlikely with the 9903, however, as this tube is so designed as to be inherently neutralized at frequencies around 150 Mc. Next, plug a 200-ma. meter into J_3 , or connect one externally in series with the plate-screen supply, as shown in Fig. 1, and apply plate voltage, preferably with a lamp load coupled to L_4 . If the stage is working correctly, it should be possible to light a 40-watt lamp to full brilliance. Check for self-oscillation by removing excitation briefly. To protect the 9903, it might be well to make these initial tests at 250 volts or so, increasing to 400 to 500 volts only when the stage is found to be working correctly.

Next, couple the output from the driver stage to the grid circuit of the final, by means of a coaxial cable and L_5 and L_6 . The latter should be the same general shape as L_7 , and mounted inside or just above it, with about $\frac{1}{8}$ -inch separation. The resonant frequency of the grid circuit can be changed slightly by altering the shape of the grid inductance. Squeezing the sides together raises the frequency; making the tank more nearly round lowers it. When the circuit is properly resonated, it should be possible to develop 25 to 30 ma. grid current, measured in series with the VR tube and ground (MA_2 in Fig. 1). The setting of the screen-to-ground capacitor, C_8 , will affect the grid current, but it may be set approximately to the proper point by adjusting it for maximum grid current with the plate voltage off. The total plate and screen current to the 9903 should be 175 to 200 ma. When the coupling loops at both ends of the coax have been adjusted so as to give maximum grid current, adjust the turn spacing of L_4 so that its tuning capacitance will be the same as that of C_1 . The two condensers may then be ganged by means of flexible couplings and an insulating shaft.

Now we are ready to adjust the final stage. Connect a 100-watt lamp at the output terminals and apply about 500 volts to the final plates and 200 or less to the screens, metering both circuits as shown in the schematic diagram. Adjust C_9 for maximum output, watching the grid and plate meters. Move the setting of the screen adjustment in small steps until maximum output, minimum plate current, and maximum grid current all occur at the same setting of the plate tuning. This is the screen adjustment at which the amplifier will operate most stably. Neutralization can also be done by running the amplifier without excitation, adjusting C_8 until there is no evidence of oscillation, but this gives a broader indication than the first method.

Should it be impossible to achieve complete stability by the screen adjustment alone, it may be necessary to add grid-plate capacitance by mounting stiff wires or tabs on the feed-through bushings. In our amplifier, the capacitance added by the feed-through rods alone was just about the right amount, however. This is not the conventional cross-over neutralization, but rather additional *grid-plate* capacitance. The amount of capacitance added is adjusted in the same way as for triode neutralizing circuits of the crossover type.

Once the amplifier is stabilized at low voltages, we proceed to final checks at normal plate and screen operating conditions. A suitable load for high-power tests is something of a problem, as no lamp combination represents a load that simulates an antenna system at this frequency. A fair load can be made, however, by connecting three or four 100-watt lamps in parallel. Lamps larger than the 100-watt variety are useless for load purposes, as they tend to develop filament hot spots and burn out before reaching anything like normal brilliance.

A method of varying the screen voltage continuously is extremely useful at this juncture, as the final tubes can be made to draw any desired

plate current by suitable variation of the screen voltage. Adjusting a tetrode amplifier is a more complex process than with triodes, and the screen is the critical element. Screen dissipation should be watched closely to see that it does not run much over 20 watts in plate-modulated service or 30 watts on c.w., and it is strongly recommended that a screen-current meter be made a permanent part of the metering system. Efficient operation is possible over a range of 800 to 2500 volts on the plates; the efficiency running better than 50 per cent in our measurements. Power was measured with a u.h.f. wattmeter, so the figures represented the power that can be delivered to an antenna transmission line. Lab tests were made at up to 900 watts input.

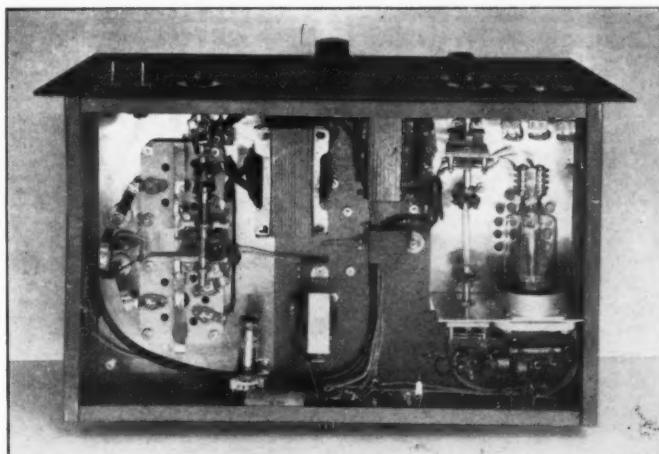
The tetrode amplifier with separate screen voltage supply should never be operated without load, or with no plate voltage applied. Screen dissipation is certain to be excessive with plate voltage removed. Here we must throw out one of our most cherished indications of amplifier efficiency, the unloaded plate-current dip at resonance. To operate a rig like this without load is to invite tube failure, soon!

Tests with the lamp load should be monitored for freedom from modulation. With some types of chokes for L_{10} , there may be a tendency to oscillation at some audible frequency. Should this develop, it can be damped by loading the choke slightly with a resistor, as shown by R_8 in Fig. 1. The highest value of resistance that will stop the oscillation should be used, if any is necessary. Substituting another choke is a better method. It should have a minimum of 5 henrys inductance, but a wide variety of small filter chokes may be satisfactory.

In prolonged tests in the Headquarters Lab, and on the air at W1HDQ, this transmitter has demonstrated its ability to run smoothly at the manufacturer's maximum ratings for the frequency, 600 watts input on 'phone and 750 to

(Continued on page 112)

Looking under the chassis of the high-power 2-meter rig. At the lower right are the components of the tripler stage, with the AX-9903 driver tube just above the aluminum partition. The 4-125A sockets, grid circuit, and screen-neutralization capacitor are at the left. The VR-tube bias system is mounted on the rear chassis wall.



The Siamese Paddle

A Key To Key the Keyer

BY MYRON HEXTOR,* W9FKC

ALMOST anyone who has built an electronic keyer has gone through the experience of discovering, usually after completing the electronic part, that the control mechanism—the switch, or key—can be much more of a problem. A glance at the circuit of one of these devices fails to show why an old hacksaw blade wouldn't do the trick. But this is far from the truth. Positive and reliable control requires a considerable degree of mechanical refinement, as attested by the fact that a ham will often chop up a twenty-dollar bug to get the few essential parts he needs. Satisfactory homemade substitutes require greater than an ordinary amount of skill with tools.

However, I recently discovered that there is a very simple solution to the problem. A pair of ordinary inexpensive straight keys can be made into a de luxe keyer control in less than an hour, if you don't insist on trimming it up. It not only supplies a good wobble-free mechanism, but it also provides for convenient adjustment of tension and contact spacing, satisfying the most finicky operator.

As the photograph shows, it is simply a matter of mounting the two keys back to back in a vertical position. The keys shown in the photographs are Type J-38, selling in surplus for as low as 85 cents each, although almost any other type can be adapted. The J-38s are particularly suitable because they come mounted on bakelite bases, one of which can be put to use since most electronic-keyer circuits require insulation for all three terminals of the control.

Construction

First remove the two keys from their bases, strip one of the bases of the remaining hardware and remove the shorting levers from both keys. It may be necessary to lift the key arm out of

• Most of those who have built electronic keyers will tell you that the toughest part of the job is getting a smooth-working keying mechanism. In this article, W9FKC comes up with an answer so effective, and yet so simple, that you will say, "I wonder why someone didn't think of that before."

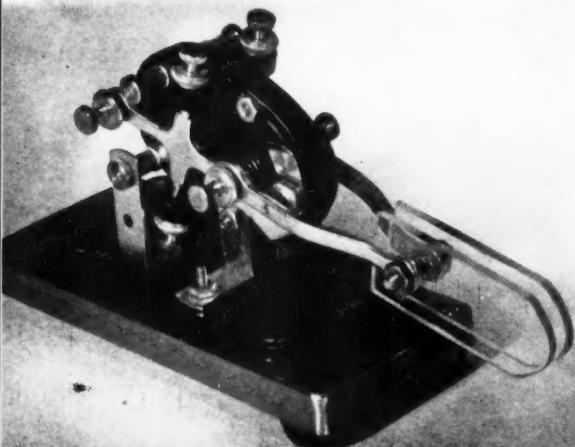
its bearings to get at the screw holding the lever. Now place the keys on edge, with their bottoms facing, and clamp them together with a 6-32 machine screw through the upper mounting-screw hole. Using another 6-32 screw through the lower mounting hole, fasten a 1-inch hardware-store angle piece on each side with the legs extending outward. (The brass-plated pieces usually found in hardware stores, but less often in dime stores, make a much neater job than the common iron variety.) Make sure that the strap connecting the stationary key contact to its terminal doesn't short against the angle piece.

The front end of the assembly is supported on 1½-inch hardware-store angle pieces. One leg of each of the two pieces is shortened by cutting it off about midway between the two holes. One of these angle pieces is then fastened to the lower terminal of each key, using the terminal cap screw through the top hole in the longer leg of the angle piece. The short legs should point inward.

One of the J-38 bakelite bases is then marked and drilled to fit the holes in the feet of the mounting angles. The key should be placed with the feet approximately centered on the base. The holes should be well countersunk underneath so that flat-head mounting screws do not protrude.

(Continued on page 114)

* Box 73, Ravinia, Ill.



By simply mounting two standard keys back to back in this fashion you can have a de luxe control for an electronic keyer in less time than it takes to tell about it.

A Phase-Angle Detector for R.F. Transmission Lines

Easily-Constructed Device for Checking Matching and Line Operation

BY G. ROBERT MEZGER,* W2BLL

• Here is another of the many devices that are becoming of greater importance to the amateur as the problems of TVI and of getting the most out of complicated present-day transmitters increase. This simple device not only will tell much about how your transmission line is terminated, but it will do it while the transmitter is operating under full power and as the frequency is shifted.

THE AMATEUR owes a little thanks, at least, to the TVI problem; for, like so many things that we are doing these days, the work which led to the story of this little phase-angle detector was undertaken simply out of the necessity for it while attacking the greater problem of TVI. To get a low-pass filter working properly in the output circuit of a transmitter, the filter must be inserted in a transmission line that is "flat." And to get a flat line one of the two conditions necessary to describe fully the termination is the requirement that it have unity power factor. Or to put it in other words, the load seen by the line must be purely resistive, with no reactive component. The magnitude of the impedance that is necessary to terminate a transmission line properly is not discussed here, although it is planned finally to build a device that will detect both magnitude and phase angle. It is hoped that such work, if successful, will make this article just an interim report.

The arrangement of equipment at W2BLL is typical. The output stage of the transmitter feeds a length of nominal 50-ohm RG-8/U cable that feeds the antenna tuner. The antenna is a simple 66-foot dipole, fed at the center with feeders 33 feet long, and it is presently used for the 3.5-, 7-, and 14-Mc. bands. The antenna tuner is the usual link-fed parallel-resonant circuit with the antenna feeders tapped on the coil at a point hoped to be the proper one to reflect 50 ohms of pure resistance at the output terminal of the coaxial line feeding the tuner.

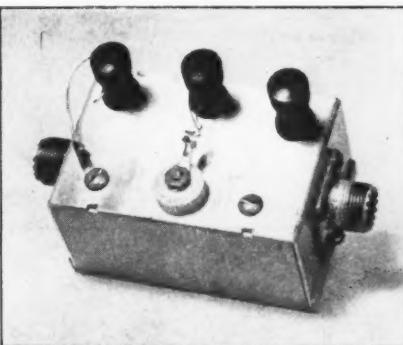
A partial solution to the problem has been achieved by utilizing some of the work described in a Naval Research Laboratory Report written by V. True.¹ In connection with its basic subject, *NRL Report 3755* describes two devices for making measurements on radio-frequency transmis-

sion lines, between transmitter and antenna tuner, that should be of great interest to the amateur. One of these, the phase-angle detector, is described here.

The Phase-Angle Detector

The basic circuit of the phase-angle detector is shown in Fig. 1. The general similarity of this circuit to the well-known Foster-Seeley discriminator, used for f.m. detection, will be apparent. The significant distinction is that the circuit of the phase-angle detector is untuned, so that it is phase-conscious, rather than frequency-conscious as is the more familiar circuit. Qualitatively, the operation of the phase-angle detector can best be described by reference to the vector diagrams of Figs. 2 and 3.

The voltage across capacitor C_2 is always in phase with the voltage, V_L , across the transmission line. Similarly, the voltage developed across the inductor L_2 is always different in phase from the line current, I_L , by 90 degrees; and if the coil is center-tapped, as here, and if the base of the vector diagram is chosen as the vector E_{C2} , the voltage across capacitor C_2 , then it may be said that the voltage E_A , across L_A , the left-hand side of L_2 , leads the line current by 90 degrees, while the voltage E_B , across L_B , the right-hand side of L_2 , lags the line current by 90 degrees. Of course, when the inductor L_2 is properly center-tapped, E_A equals E_B . Then, with respect to the voltage and current in the transmission line, the vector diagrams of Fig. 2 describe the conditions.



Although it is easily fitted into a miniature box, the phase-angle detector is a highly useful device for antenna circuit adjustment and s.w.r. monitoring — and can be left permanently in the line with transmitters up to the legal power limit.

* 617 Beverly Road, Teaneck, N. J.

¹ Naval Research Laboratory Report 3755, "An Automatic Antenna-tuning Unit," by V. True, Nov. 2, 1950. See also: "Automatic Impedance Matcher," by Virgil True, *Electronics*, December, 1951, p. 98.

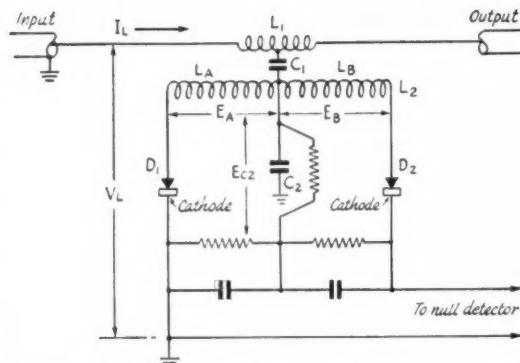


Fig. 1 — Basic circuit of the phase-angle detector.

On the secondary side, the operation of the phase-angle detector may be described as follows: The voltage across either crystal diode, D_1 or D_2 , will be the sum of the voltage across capacitor C_2 and the voltage across the particular side of the center-tapped coil, L_2 , across which the diode in question is connected. Thus, a change in the phase angle between the voltage across C_2 , which voltage is always in phase with the transmission-line voltage, V_L , shown in Fig. 2, and the voltage across the coil, causes the vector sum of these voltages to change, and the rectified voltages developed across the diode load resistors, R_1 and R_2 , will change.

From the vector diagrams of Fig. 3, it will be seen that when the line current leads the line voltage, the voltage E_{D1} developed by D_1 will be less than E_{D2} , the voltage developed by D_2 , and the output voltage will be positive. Similarly, when the line current lags the line voltage, Fig. 3B, the voltage developed by D_1 will be greater than that developed by D_2 and the output voltage will be negative. At unity power factor, of course, the rectified voltages are equal and the output is zero.

The sensitivity of the phase-angle detector will increase as the frequency increases because

the voltage induced in L_2 will increase with frequency. It may be difficult, therefore, to employ the same detector circuit for operation on both 1.8 Mc. and 28 Mc., but the device described here operates satisfactorily over the range from 3.5 Mc. through 14.4 Mc. Fig. 4 is a plot of the typical operation of the device described here when operated at a frequency of 7200 kc. This plot clearly shows some unbalance, a condition that yet remains to be corrected.

Construction

The circuit of the phase-angle detector used in these experiments is shown in Fig. 5. Since shielding between the r.f. and other circuit components would be desir-

able, the device can be constructed by using two ICA "channel-lock" aluminum boxes of the smallest available size, 4 by $2\frac{1}{2}$ by $1\frac{1}{4}$ inches in size. The channels of the two boxes should be fastened together along their 4 by $2\frac{1}{2}$ -inch dimensions using the junction of C_1 , R_1 , and D_1 as one fastening and using C_4 , a feed-through capacitor, as the other fastening. The "top" box should contain the input and output connectors for the coaxial cable, L_1 , L_2 , D_1 , D_2 , C_2 , and R_2 . The lower box should contain R_1 , R_3 , C_3 , C_4 , C_5 , and L_3 .

L_1 is nothing more than the inductance of a straight piece of No. 12 copper wire extending through the box from one coaxial terminal to the other. The capacitor C_1 is the stray capacitance between L_1 and L_2 .

Inductor L_2 is wound, with No. 22 d.c.e. wire, on a rectangular wooden form two inches long by $\frac{1}{2}$ inch high. It is a five-turn center-tapped coil, and it seems to give adequate sensitivity, even at low powers and at low frequencies. Fewer turns could be used for high power and for higher frequencies, but as the number of turns is decreased it becomes more difficult to locate the center tap physically in the exact electrical center of the circuit. L_1 and L_2 are so oriented that the straight wire, L_1 , lies in the plane of the rectangular coil L_2 .

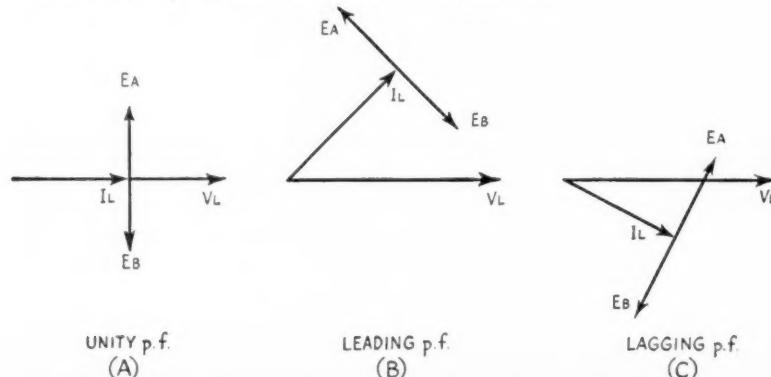


Fig. 2 — Relations between secondary voltage and voltage and current of transmission line.

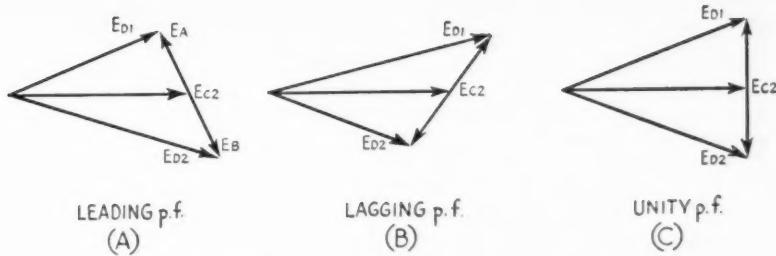


Fig. 3 — Relations among secondary voltages in phase-angle detector.

Circuit constants given are for use with Type 1N34 crystals. If Types 1N38 or 1N67 are used, R_1 and R_3 may be increased to approximately 0.3 megohm, thereby increasing the sensitivity of the circuit.

It is obvious that resistor R_3 causes a loss in output voltage from the phase-angle detector. It has been used only because of the advantage of small physical size. A 2.5-mh. r.f. choke would be preferable.

Because the output signal developed by the phase-angle detector is developed in a high-impedance circuit, the indicator of that signal must be either a sensitive microammeter or a high-impedance vacuum-tube voltmeter. If a microammeter is used, a zero-center instrument with a range of 100-0-100 microamperes probably will be satisfactory. The work described here has been done using an ordinary vacuum-tube voltmeter on its lowest range with the zero adjustment turned to make it operate as a zero-center instrument.

Operation

In the brief period of time so far available for experimenting with the phase-angle detector, it has been used here only at the antenna-tuner end of the coaxial feed line between the transmitter and the tuner. Thus, it has been employed only in a position chosen to tell us what may be the phase angle of the load seen by the coaxial cable at its termination or, conversely, something of the nature of the load reflected to the termination of the coaxial line by the antenna, through the antenna tuner. This information, of course, has helped give answers to such questions as whether the antenna tuner is tuning out all the reactance of the antenna system, and whether the reflected impedance of the antenna is inductive or capacitive.

A little experience with the phase-angle detector has shown that if, after a thorough check of wiring, the detector fails to indicate a null when the antenna tuner acts as though the antennas were properly tuned, then it is most likely that the antenna tuner is not tuning out all the reactance of the antenna. This difficulty has occurred a number of times, using this little detector. In each case it has been corrected by changing taps on the antenna tuner, changing the length of the antenna feed line, or both. This manifestation of the effect of improper matching

between antenna and transmitter causes us to consider the phase-angle detector as a pseudo-s.w.r. indicator. It is true that when the s.w.r. is unity the phase-angle detector will indicate a null; but it is not necessarily true that when the phase-angle detector indicates a null the s.w.r. is unity. Rather, the phase-angle detector simply shows that the reactance reflected back from the antenna, through the antenna tuner to the feed line from the transmitter, is either present, capacitively or inductively, or is zero. It says nothing about the magnitude of the resistance that the feed line from the transmitter sees when a null is indicated by the phase-angle detector. That is, the phase-angle detector will show when the impedance seen by the feed line from the transmitter has been changed from the general expression $R \pm jX$ to the form $R + j0$, but it will tell nothing about the magnitude of R . This in itself is useful information when attacking the s.w.r. problem, but it is not the complete answer.

Conclusion

In spite of the limitations mentioned in the foregoing paragraph, the phase-angle detector can be usefully employed, in many cases, as a monitor of the s.w.r. If the antenna tuner and its associated load, the antenna, are first matched to the link coil feeding it from the output of the coaxial transmission line so that the line is terminated

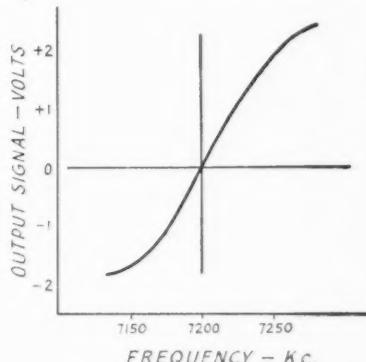
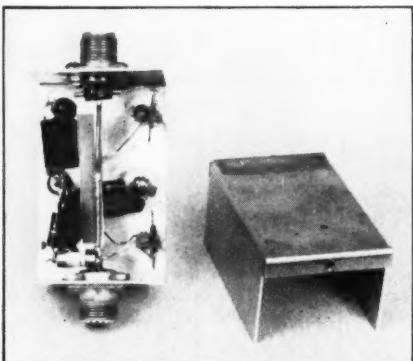


Fig. 4 — Plot of typical output of device of Fig. 5 at a frequency of 7200 kc.

properly, by using an s.w.r. bridge, and if the phase-angle detector is installed at the input end of the line, then the phase-angle detector does tell when the s.w.r. is unity or when it departs therefrom. A mismatch of any sort at the antenna tuner will cause the input impedance of the line to have a reactive component. The one exception to this case is when the load is still resistive and the line is an exact multiple of $\frac{1}{4}$ wave in electrical length; this length easily can be avoided. So, after a preliminary matching, the phase-angle detector becomes an s.w.r. monitor, or serves to indicate adjustments at the antenna tuner, as after changing frequency, that will bring the s.w.r. back to a minimum.

The phase-angle detector has proved itself to be a very useful little gadget for tuning a transmitter and the antenna that goes with it. It has, for example, shown that maximum power output is not necessarily the point where final-amplifier-plate current is maximum and everything seems to be "in tune." It has shown the proper amount of coupling to employ with variable-link coils to obtain good power transfer with minimum coupling. It has helped to locate the reason, in specific cases, why tuning capacitors are over because of high standing waves. Because its output potential changes polarity with phase angle, it will identify the reactance present, so that one easily can determine whether the load is capacitive or inductive. And if, after adjusting the load to eliminate reactance, the output voltage of only one-half of the circuit is read, the voltage is an index of output power. In another article² Walt Knoop describes another ingenious and interesting application of this circuit, in this case as the detecting device for an automatic antenna tuner.

It is obvious that the work and the results mentioned here are rather sketchy. That is



Internal layout of the experimental unit. The five-turn secondary coil is concealed by a rectangular piece of cardboard that serves to prevent it from touching the "primary" — the straight-through connection between the two coax fittings. The long sides of the secondary turns are parallel to the primary wire. An alternative method of construction that provides shielding between the r.f. transformer and other components is suggested in the text.

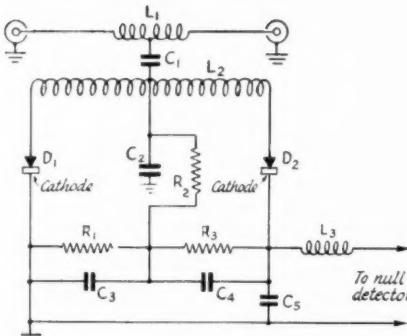


Fig. 5 — Circuit of the phase-angle detector.

C₁ — Stray capacitance.

C₂ — 300 μfd .

C₃, C₄, C₅ — 1500 μfd .

R₁, R₂ — 0.1 megohm, $\frac{1}{2}$ watt.

R₃ — 27,000 ohms, $\frac{1}{2}$ watt; or 2.5-mh. r.f. choke.

L₁ — See text.

L₂ — See text.

L₃ — 2.5-mh. r.f. choke.

because we have been playing with this little gadget for only a very short time; but in this brief period, it has proved so useful and helpful that it seemed more desirable to write a short report describing the basic device, even if the work is only partially completed, rather than wait the long time necessary for more complete exploitation of the possibilities of this circuit.

² "Automatic Tuning of the Antenna Coupler," by W. A. Knoop, to be published in a subsequent issue.

Silent Keys

IT is with deep regret that we record the passing of these amateurs:

W1PCC, Charles J. Crabbill, Lowell, Mass.

W2NFM, Clayton B. Legallez, Slingerlands, N. Y.

W2NFQ, Mario J. Bruscia, Brooklyn, N. Y.

ex-2RE, Louis G. Pacent, New York, N. Y.

W2SMP, David Nabutobsky, Trenton, N. J.

W2YU, Abe Hass, Mt. Vernon, N. Y.

ex-3MS, C. W. Gilbert, Philadelphia, Pa.

W4DSY, Robert E. Dawson, Jr., Charlotte, N. C.

W4DU, Orville R. Cheatham, Jacksonville, Fla.

WN6MUI, Dr. J. Van Beekelaere, San Diego, Calif.

W6QZN, Albert J. Layos, Hollywood, Calif.

W6SLT, Edna McGeorge, Los Altos, Calif.

ex-W7AAO, George M. Ohi, New York, N. Y.

W7QKQ, Merle A. Cook, Boulder City, Nev.

WT7JH, H. O. George, Tucson, Ariz.

ex-9AHM, Fred O. Grimwood, Quincy, Ill.

W9FFV, William A. Markland, Lawrenceburg, Ind.

W9NYR, George Pabst, Chicago, Ill.

W9RN, Dr. J. Wilson Gray, Geneva, Ill.

W9AFQ, John P. Breheny, Keokuk, Iowa.

W9QYL, Albert P. Smith, Holyoke, Colo.

W9YKX, William A. Copeland, Woodbine, Iowa.

G5IQ, R. Frank Speake, Wolverhampton, Staffordshire.

HI8FA, F. A. Sanabria, Ciudad Trujillo

ZL4HP, T. E. Neville, Moa Creek, Otago

Getting the Most Into Your Antenna

A Simple Explanation of the Fundamentals Involved

BY RICHARD M. SMITH,* WIFTX

* A frequent stumbling block is the problem of getting the power generated by the transmitter into the antenna. This, the first of two articles on the subject, gives the Novice the basic fundamentals he needs to solve his coupling problems. A subsequent article will describe the construction and use of the antenna couplers he needs to make use of the principles he can learn here.

ANTENNAS and antenna coupling are not "mysterious" subjects. They only seem that way to the Novice because he finds it more difficult to know when he is doing the right thing than in other phases of the hobby. He can tell, for example, when his transmitter is working properly merely by watching the plate milliammeter and listening to the tone of the signal in his receiver. But what does he do when the meter shows him that "everything is working right" but he still doesn't get any answers to his calls? Is his location poor, conditions bad, or what? Admittedly these factors may exist, but in more cases the trouble is that the power just isn't getting into the antenna.

With a half-way efficient transmitter, a mediocre location, and anything but a complete "washout" of radio conditions you'll "get out" if you get the power into the antenna. If you don't, the best transmitter, the best location, and the best antenna in the world won't help you. It is important, therefore, to pay close attention to the antenna coupling system in your station. It can mean the difference between failure and success.

Some Fundamentals

It is easy to get power into an antenna, if the right kind of coupling device is connected to the feed line at the right point. Before you can understand this and thereby learn what to do to make your antenna and its feed line work properly, there are a few basic fundamentals of antenna operation that must be learned. We won't go into all of the theory involved, but will state the more important considerations that must be kept in mind. For more detailed discussion of the theoretical aspects, you can refer to the *A.R.R.L. Antenna Book*.

First of all, the easiest way to get power into your antenna is to start out with an antenna system that is resonant. Coupling problems are then much simpler. When we say "system," we mean all of the wire involved, from the antenna coupler out to the end of the line. To be resonant, the antenna system must be cut to a length determined by the frequency or wavelength at which it is to

operate. A wire is resonant when its length is exactly equal to one half wavelength (or any multiple thereof) at the frequency of operation. Exact figures, in feet and inches, can be computed from simple formulas contained in both the *Antenna Book* and *The Radio Amateur's Handbook*. The main point, so far as this discussion is concerned, is that it is easiest to couple to a resonant antenna system, and to be resonant it must be cut to the correct length.

The next important point concerns the way current and voltage are distributed on an antenna. Again skipping the theory that can be obtained elsewhere, Fig. 1 shows the current distribution

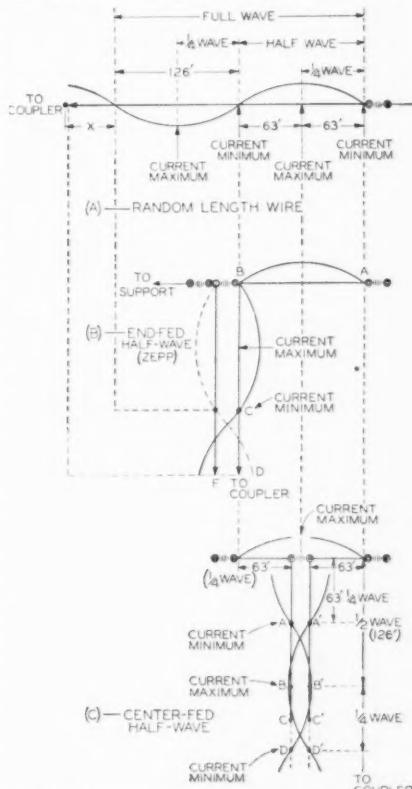


Fig. 1 — Current distribution in three different types of antenna. Note the way the current patterns repeat themselves, but in the opposite polarity, throughout alternate half waves. The dimensions shown are those computed for half-wave antennas operating at 3725 kc., the center of the present Novice assignment in the 3.5-Mc. amateur band.

* Technical Assistant, QST.

bution on three different antenna systems. In sketch A, a random-length wire is shown. Assume for a moment that power is applied to the end of the wire from the transmitter. Current flows down the wire, but when it reaches the end insulator, it must stop. This is the key to all of the various current distribution diagrams that you will encounter in reading about antennas, and it is often overlooked by newcomers. A current minimum, or null, *always* occurs at the end of the wire, simply because it has to. Based on this fact, drawing a diagram of the current distribution on any antenna, resonant or not, becomes a simple matter, because it will follow a regular pattern dictated by the length of the wave at the particular frequency involved. The pattern is always as shown in sketch A of Fig. 1, with current being minimum at the far end of the wire, at maximum one quarter wavelength back toward the source, returning to minimum again one half-wavelength from the far end. If the wire is more than one half-wavelength long, current reaches another maximum three quarters of a wavelength from the end, and is back at minimum again a full wavelength from the end.

Note that the second maximum-current point is shown on the opposite side of the line to the first. This is to indicate that the current flows in the opposite direction in this section of the wire, because the polarities change during succeeding half waves (half cycles). If the wire were to be extended several wavelengths more, the same patterns would exist, with the current maxima and minima occurring regularly a quarter-wavelength apart, and with the direction of flow, or polarity, reversing every half-wavelength throughout.

The distribution of voltage on a wire is exactly opposite to the current distribution curve. Maximum *voltage* points occur at the minimum *current* points, and minimum voltage points correspond to maximum current points. Actually, it is necessary to think in terms of only one, either current or voltage, because we know that when one is at maximum, the other is at minimum. We choose to talk in terms of current distribution here because it is easier to measure current than voltage at radio frequencies.

The Single-Wire Antenna

As shown in sketch A of Fig. 1, a straight length of wire, whether it be cut to a resonant length or not, can be used as an antenna. Radiation takes place from the entire length of wire, regardless of where it is installed. Thus, if part of the antenna is low to the ground, surrounded by buildings and trees, as it usually is at the transmitter end, a portion of the power radiated is apt to be absorbed by the surrounding objects. It is better to try to design a system in which all of the radiation takes place from a wire that is supported high above the ground, and away from surrounding objects. This requires some means for getting the power up to the antenna in a feed line that will not radiate, but which will deliver the power to the place from which we wish it to be

radiated. The same current-distribution characteristics that we've been talking about present the solution to this problem. We know that electrical charges of equal intensity and opposite polarity cancel one another. Radiation from a pair of wires, spaced a few inches apart, will be negligible, therefore, if the current in the two wires is equal and opposite. This is called a balanced feed line. How the desired relationship between the currents in the two wires is achieved is shown below.

The Zepp Antenna

In this system, one side of a two-wire feed line is connected directly to one end of a *resonant* "flat top," and the other side is left "floating." (It must be insulated from both the flat top and the supporting wire, or rope, as shown in sketch B of Fig. 1.) In order to understand how we can get a balanced feed line out of this arrangement we must consider the current distribution on the flat top as well as the feeders, because the feeders are actually an extension of the flat top, bent down from the plane of the wire in the flat top. This can be seen by following the dotted lines back up to the straight wire shown at the top of Fig. 1. Note that, if the flat top is exactly a half-wave (or any multiple thereof) long, a current minimum occurs at the point of attachment of the feeders, and another current minimum occurs at point C, one half wavelength down the "live" feeder wire. The current distribution on the "dead" feeder is also shown in the diagram, with a current minimum occurring right where it has to, at the insulated end of the wire. This, of course, results in the correct relationship between currents in the two feeders. We have made them equal by cutting the flat top to the correct length, and they are opposite because of the polarity reversal which exists in adjacent half wavelengths of any piece of wire. (The two feeder wires are joined through the antenna coupler.) Being equal and opposite, the radiation from the feeders will cancel, and all the power will go into the flat top. Thus the Zepp will be able to do a better job of radiating than the single wire described earlier.

If the flat top is not cut to the correct length for the frequency of operation, the feed line currents will not be balanced, and the feeders will radiate some of the power in places where we don't want it to be dispersed, namely close to the ground near objects which can absorb it, and often close to some neighbor's broadcast or TV set where it can cause interference. What happens when the flat top is not the right length is shown in Fig. 2. Here the flat top is too short. Starting again at the far end of the wire, there must be a current minimum at the end, with a point of maximum current occurring one quarter wavelength away. The next current minimum occurs not at the junction of the feeders and the flat top, but at a point part way down the "live" feeder, how far down depending on the deficiency in length that has to be made up. Note that the distribution of current on the "dead" feeder is not changed by the fact that the antenna is too short;

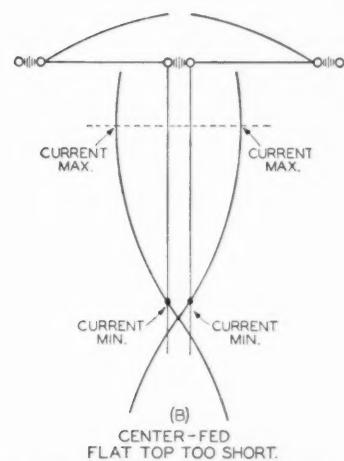
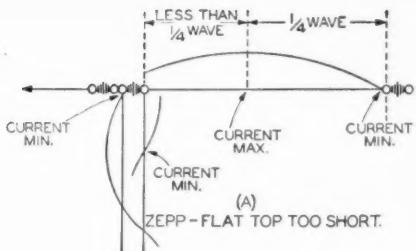


Fig. 2 — Current distribution in antennas having less than a half wavelength in the "flat-top." In the case of the Zepp, feeder unbalance results. This is not true of the center-fed antenna, making it the best bet for installation where space for a full half-wave is unobtainable.

the current minimum is right where it always has to be — at the end of the wire. Naturally, the current in this set of feeders will be unbalanced, and some of the power will be wasted on the surrounding objects.

The Center-Fed Antenna

Return now to Fig. 1, and look at sketch C, which shows the current distribution in a center-fed half-wave antenna. The feeders are attached at a point of maximum current, resulting in a situation exactly opposite to the case of the Zepp. The current minima on the feed line occur one quarter wave-length away from the point of attachment to the flat top, and both feeder wires must be considered as extensions of the flat top, not just one.

Let's see what happens when a center-fed antenna is too short. The length of the flat top shown in Fig. 2B is somewhat less than a half wave. Current minima must occur at the insulated ends of the wire, as always. Therefore, starting at either end of the antenna, and apply-

ing the same principles, we see that the current maxima must occur part way down the feed line, a quarter wavelength from the ends of the wire. Assuming that the two halves of the flat top are equal in length, these points will be opposite each other on the feed line, so the currents in the feeders are balanced, and feeder radiation is minimized.

This explains why the center-fed system is considered better than end feed. The advantage is even greater when you consider what happens when the operating frequency is changed. In the case of the Zepp, the feeder currents are balanced only when the flat top is cut to the right length for the frequency in use. With the center-fed antenna, feeder current remains balanced, regardless of the operating frequency, and regardless of whether the flat top is by itself resonant.

Thus, it is not necessary that you have space for a full half-wave antenna. If you use center feed, and there is sufficient wire in the complete system for it to be resonant, you can have an efficient antenna even though the flat top must be shortened somewhat to fit a city lot.

Coupling to the Antenna System

We've talked about the distribution of current and voltage on antennas and their feed lines solely to indicate why the total length of wire involved is important, and to show the differences encountered in various types of antenna. We said at the start that it is easy to get power into an antenna if the right kind of coupling device is connected at the right place. The right place is either a point of maximum current or minimum current. The farther away from these points you go, the more difficulty you are apt to encounter, and the midway points present a coupling problem that is often beyond the capabilities of the usual antenna coupler.

An important thing to remember is that in figuring feeder lengths, the distance from the far end of the antenna to the *coupler* is what counts, not the distance to the house, or to the transmitter. The coupler can be installed some distance away from the transmitter, if need be, but the length of the link line that connects it to the transmitter cannot be considered as part of the length of the antenna system when you are drawing current-distribution curves.

The type of coupler to use depends on whether you are going to feed power in at a point of current maximum or minimum. If your antenna system is cut so that the end of the feed line represents a current minimum (voltage maximum), you will need a parallel-tuned coupler. A series-tuned coupler is called for to insert power at a point of maximum current. A third type, the pi-section coupler, is recommended if you are forced by circumstances to use a random-length antenna with power applied at one end. All three types are described in detail in the *A.R.R.L. Antenna Book*.

Using the antenna coupler is a simple procedure once you have selected the right type, but

(Continued on page 116)

A Quadriband Mobile Transmitter

Fifty Watts Under the Dashboard

BY CHARLES J. SCHAUERS,* W6QLV

HAVING looked over almost every type of mobile installation, ranging from a 1-kw. rig downward, my ideas had become pretty well crystallized by the time I got around to building one for my own car. For one thing, I wanted to keep the trunk free for the purpose for which it was originally designed. This meant a dashboard job that would operate from a power unit sufficiently reasonable in size to fit under the hood. Therefore, the starting point was the space available under the instrument panel. Measurements showed that a cabinet of approximately 11 by 11 by 8 inches would fit nicely without undue crowding. An enclosure of this size was made by cutting down a standard utility box.

Circuit

Having determined the physical limits, the problem of circuitry was tackled next. The one shown in Fig. 1 was based on the principal requirements that included choice of VFO or crystal, operation in the most-popular mobile bands — 10, 11, 20 and 75 (including the MARS frequencies) — and an input of about 50 watts to the final amplifier with 100 per cent plate-and-screen modulation.

When operating at 75 meters, the plate circuit of the 6AG7 crystal oscillator is untuned. This permits working the 6V6 buffer-doubler (and also the 6AG7 when VFO is used) straight through without danger of oscillation. For the higher frequencies, the plate circuit is fixed-tuned, using iron-slug coil forms. For 14-Mc. operation,

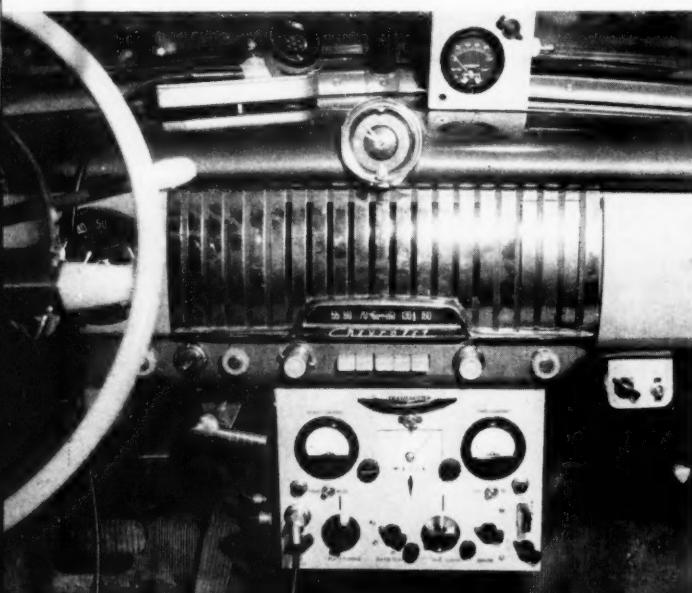
* Here is a 50-watt four-band mobile job designed for mounting under the instrument panel where the controls can easily be reached. The fact that an installation of this type leaves the trunk free for other uses is another advantage worth considering.

frequency is doubled in the plate circuit of the oscillator and doubled again in the 6V6, using crystals in the 3.5-Mc. range. Crystals in the 7-Mc. range are necessary only for 10- and 11-meter output, doubling in both stages.

The VFO, shown only in block form in Fig. 1, is a Lysco 381-R mounted on the chassis at the center of the panel. This VFO gives output on either 80 or 40, selectable by a switch. S_1 shifts from crystal to VFO. Since this model VFO is designed for low-impedance output, it was necessary to alter it slightly for high-impedance output by clipping the link coils and making connection directly to the hot end of the circuit. (Lysco also puts out a similar VFO designed for high-impedance output which, of course, would not require this alteration.)

The 807 works straight through on all bands. Excitation can be adjusted to proper value by means of R_7 , which controls the screen voltage of the 6V6. The output circuit is in the form of a pi-section network. This circuit has worked out very well on all frequencies and no TVI has been experienced operating the rig as close as practicable to a TV antenna. C_{19} , C_{20} and C_{21} are

* 15 North "G" St., Lompoc, Calif.



The quadriband mobile transmitter installed, showing the panel layout.

QST for

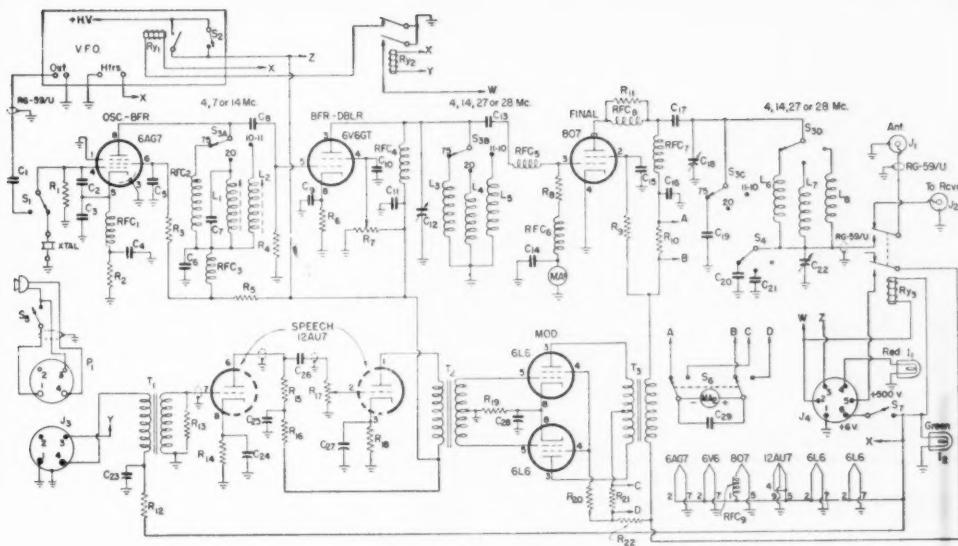


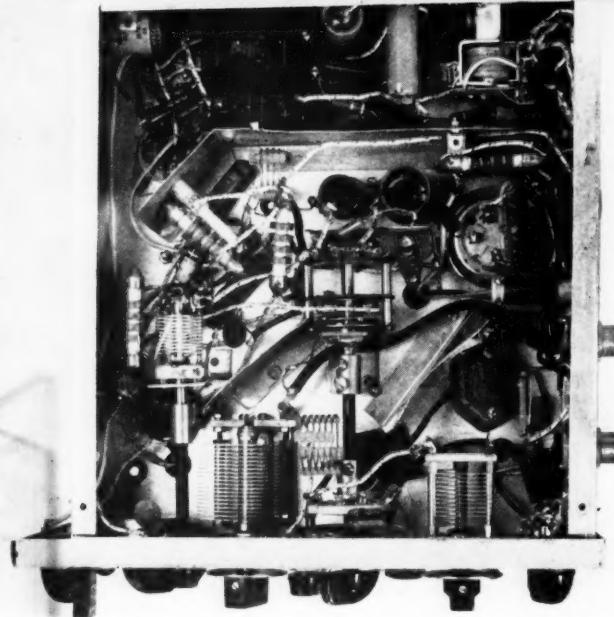
Fig. 1 — Circuit diagram of the quadriband mobile transmitter.

C₁, C₁₅ — 0.0022- μ fd. mica.
 C₂ — 12- μ fd. silvered mica.
 C₃ — 47- μ fd. silvered mica.
 C₄, C₈, C₆, C₁₀, C₂₀ — 0.001- μ fd. ceramic.
 C₅ — 22- μ fd. ceramic.
 C₆ — 47- μ fd. ceramic.
 C₉, C₁₁, C₂₆ — 0.01- μ fd. ceramic.
 C₁₂ — 75- μ fd. variable (National PSE-75).
 C₁₃ — 100- μ fd. mica.
 C₁₄ — 0.0047- μ fd. mica.
 C₁₆ — 0.001- μ fd. 1000-volt mica.
 C₁₇ — 470- μ fd. 1000-volt mica.
 C₁₈ — 140- μ fd. variable (National ST-140).
 C₁₉ — 100- μ fd. 1000-volt mica.
 C₂₀ — 470- μ fd. ceramic.
 C₂₁ — 330 μ fd. ceramic.
 C₂₂ — 300- μ fd. variable (National STH-300).
 C₂₃ — 500- μ fd. 12-volt electrolytic.
 C₂₄, C₂₇ — 10- μ fd. 25-volt electrolytic.
 C₂₈ — 50- μ fd. 25-volt electrolytic.
 R₁, R₃, R₄ — 47,000 ohms, $\frac{1}{2}$ watt.
 R₂ — 470 ohms, $\frac{1}{2}$ watt.
 R₅, R₁₀, R₁₂, R₂₁ — 47 ohms, $\frac{1}{2}$ watt.
 R₆ — 330 ohms, $\frac{1}{2}$ watt.
 R₇ — 25,000-ohm wire-wound potentiometer.
 R₈ — 22,000 ohms, $\frac{1}{2}$ watt.
 R₉ — 20,000 ohms, 10 watts.
 R₁₁ — 100 ohms, $\frac{1}{2}$ watt (see text).
 R₁₃ — 0.47 megohm, $\frac{1}{2}$ watt.
 R₁₄ — 2200 ohms, $\frac{1}{2}$ watt.
 R₁₅ — 0.1 megohm, $\frac{1}{2}$ watt.
 R₁₆ — 4700 ohms, $\frac{1}{2}$ watt.
 R₁₇ — 0.5-megohm potentiometer (log taper).
 R₁₈ — 560 ohms, $\frac{1}{2}$ watt.
 R₁₉ — 250 ohms, 10 watts.
 R₂₀ — 15,000 ohms, 10 watts.
 R₂₂ — 900 ohms, 20 watts.
 L₁ — Approx. 10 μ h. — 32 turns No. 20 enam. (Millen 69045 iron-slug form, $\frac{1}{2}$ -inch diam.).

fixed condensers augmenting the variable condensers C₁₈ and C₂₂. RFC₅, RFC₈ and RFC₉ are v.h.f. parasitic chokes. The milliammeter M_{A1} reads 807 grid current, while M_{A2} may be switched to read either modulator or final-amplifier plate current.

L₂ — Approx. 2.5 μ h. — 19 turns No. 20 enam. (Millen 69045 iron-slug form, $\frac{1}{2}$ -inch diam.).
 L₃ — 45 μ h. — 48 turns No. 26 enam., 1-inch diam., close-wound.
 L₄ — 1.7 μ h. — 14 turns No. 18 enam., $\frac{3}{4}$ -inch diam., 1 inch long.
 L₅ — 0.4 μ h. — 4 turns No. 18, 1-inch diam., $\frac{1}{2}$ inch long (B & W 3014 Miniductor).
 L₆ — 10 μ h. — 32 turns No. 20, 1-inch diam., 2 inches long (B & W 3015 Miniductor).
 L₇ — 2.5 μ h. — 15 turns No. 18, 1-inch diam., 2 inches long (B & W 3014 Miniductor).
 L₈ — 0.7 μ h. — 6 turns No. 18, 1-inch diam., $\frac{3}{4}$ inch long (B & W 3014 Miniductor).
 I₁, I₂ — 6.3-volt dial lamp (see text).
 J₁, J₂ — Female coaxial-cable connector.
 J₃ — 3- or 4-contact shielded connector.
 J₄ — 6-prong male connector.
 M_{A1} — D.c. milliammeter, 10-ma. scale.
 M_{A2} — D.c. milliammeter, 200-ma. scale.
 P₁ — Male connector to match J₃.
 RFC₁, RFC₂, RFC₃, RFC₄, RFC₆, RFC₇ — 2.5-mh. r.f. choke.
 RFC₅ — 15 turns No. 20 enam., close-wound on pencil.
 RFC₈ — 9 turns No. 20 enam., wound on R₁₁.
 RFC₉ — 19 turns No. 20, $\frac{1}{2}$ -inch diam.
 R_{V1} — 6.3-volt relay.
 R_{V2} — 6.3-volt d.p.s.t. relay.
 R_{V3} — 6.3-volt d.p.d.t. relay.
 S₁ — S.p.d.t. rotary switch.
 S₂, S₇ — S.p.s.t. toggle.
 S₃ — Bandswitch (see text).
 S₄ — Miniature single-circuit 3-contact rotary switch.
 S₅ — Push-to-talk switch at microphone.
 S₆ — D.p.d.t. toggle switch.
 T₁ — Microphone transformer, single-button.
 T₂ — Interstage audio transformer, single plate to p.p. grids, ratio 1:2.
 T₃ — Universal modulation transformer, 30 watts (UTC S-19).

The audio section consists of a two-stage speech amplifier using a single 12AU7 and a 6L6 Class AB₁ modulator. Although sufficient gain is available for a dynamic or crystal microphone, I use a hand microphone fitted with a W.E. F-1 carbon button. Full modulation is



Bottom view of the quadri-band mobile rig showing the general arrangement of major components.

obtained with the gain control backed down near minimum.

A PE-103 dynamotor is used to supply the final amplifier and modulator stages, while a 300-volt 100-ma. vibrator pack supplies all other stages. If the negative side of the battery in your car is grounded, as it is in mine, the polarity of the high-voltage output of the PE-103 can be corrected by reversing the connections to the high-voltage brushes.

Control Circuit

The toggle switch, S_7 , turns on the filaments and the hot side of the car battery to the relays and microphone. It also lights the green indicator lamp, I_2 . Closing the microphone switch, S_5 , operates Ry_2 . The contacts of Ry_2 operate Ry_1 , which I mounted in the VFO unit, closing the VFO plate-voltage circuit and, through connection W , operate the antenna relay, Ry_3 , and the power relay, Ry_2 , in Fig. 2. The latter starts the dynamotor, turns on the vibrator pack via Ry_1 and lights the red indicator lamp, I_1 . A second set of contacts on Ry_3 closes the high-voltage circuit to the final amplifier and modulator.

A switch, S_1 in Fig. 2, mounted on the dashboard, permits turning on the vibrator pack alone for tuning up the crystal oscillator and doubler. In setting the VFO to frequency, S_2 (also added to the VFO unit) must be closed. The VFO can also be used as a b.f.o. in c.w. or s.s.b. reception.

Construction

The important details of construction are shown in the photographs. The chassis measures $10\frac{3}{4}$ by 10 by 3 inches and, in my case, setting the chassis off center on the panel made installation easier. On top of the chassis the VFO unit is

placed against the panel in the center of the chassis. A window is cut in the panel to expose the calibrated dial. The audio tubes and the modulation transformer are lined up along the rear of the chassis. To the left of the VFO are the 75- and 20-meter output coils, L_6 and L_7 , mounted at right angles on stand-off insulators, and the 807 immediately to the rear. The 6V6 is off the right rear corner of the VFO unit. The 6AG7 and its associated plate coils are hidden behind the panel in the space to the right.

Underneath, the bandswitch is at the center. The ceramic wafer at the front, fastened to the panel, is a two-circuit unit carrying the circuits of S_{3C} and S_{3D} . The 10-meter coil, L_8 , is soldered directly between the switch contact and the stator terminal of C_{22} to the left in the bottom-view photograph. C_{13} is the variable to the right. The two remaining bandswitch wafers, S_{3A} and S_{3B} , are of bakelite and are mounted on a bracket which places the sections at almost the exact center of the chassis. S_{3B} is to the rear, with the associated coils, L_3 , L_4 and L_5 , lined up across the rear. C_{12} is to the left, mounted on a bracket. S_4 is panel-mounted close to the control of the bandswitch. The antenna change-over relay, Ry_3 , is mounted against the right-hand edge of the chassis, between the two coaxial connectors, J_1 and J_2 . A short piece of RG-59/U connects the relay contacts to the stator of C_{22} . Small baffle shields are placed between C_{12} and C_{22} , and between the rear section of the bandswitch and C_{13} .

To the rear of the chassis, behind a shielding barrier, are the microphone and driver transformers and small components of the audio section. The control relay, Ry_2 , is mounted to the right on a small stand-off insulator.

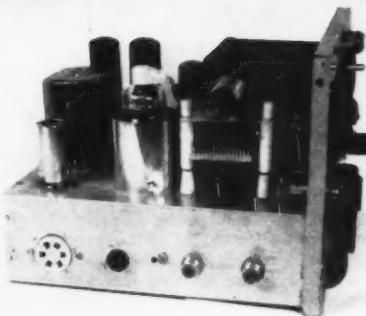
On the panel, the two meters are mounted

to either side of the VFO unit. The filament switch, S_7 , and the green signal lamp, I_2 , are below the grid-current meter, MA_1 , to the right, while the meter switch, S_6 , and the red signal lamp, I_1 , are to the left. The microphone connector and audio gain control are below the red lamp. Below the green lamp to the right are the crystal socket and the crystal-VFO switch, S_1 . The tuning control for C_{12} is the small knob to the right of the dial for C_{22} . The excitation control, R_7 , is below the filament switch. The toggle switch above the VFO dial is S_2 in the VFO unit.

Adjustment

Prior to installation, the VFO is tuned up for maximum output, as are the output coils of the crystal oscillator. A grid-dip meter comes in handy for this adjustment. The buffer-doubler is then tuned for maximum 807 grid current and the excitation adjusted by R_7 to give an 807 grid current of 3 to 4 milliamperes. In adjusting the coupling to the antenna or transmission line, C_{22} is placed at some setting and then C_{18} is resonated for the usual plate-current dip. If the resulting plate current is too low or too high, C_{22} is adjusted to a different setting and the circuit re-resonated with C_{18} . It should be possible to load the final up to 100 ma. on all bands. I have found it possible to maintain satisfactory loading over a range of about 125 kc. on 75 without readjusting the antenna length or the loading-coil inductance. On this band it is usually necessary to switch in either C_{20} or C_{21} to obtain proper loading.

A small field-strength meter is used for tuning the transmitter for maximum output. This is



Side view of W6OLV's mobile rig showing the mounting of the 20- and 75-meter output coils. The 12AU7 speech tube is the shielded tube to the left.

connected to the regular auto antenna on the cowl and placed on the floor when not in use. The auto antenna is not fully extended. False loading with the pi-section network is avoided in this manner.

The total battery drain with full load to the final runs about 40 amperes, so it is a good idea to keep the motor running while transmitting.

Consistent results have been obtained on 75 up to 300 miles in daylight and stations as far away as 2500 miles have been contacted at night with S5 to "S9-plus-40" reports. Best DX on 20 is Japan, and nearly every station called in reply to a CQ has been raised.

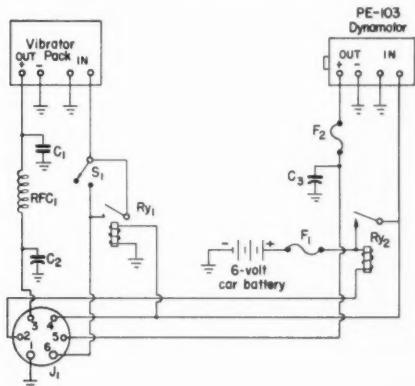


Fig. 2 — Power circuits of the quadriband mobile transmitter.

- C_1 — 2- μ fd. 500-volt paper.
- C_2 — 8- μ fd. 400-volt electrolytic.
- C_3 — 4- μ fd. 600-volt electrolytic.
- F_1 — 50-amp. fuse.
- F_2 — 300-ma. fuse.
- J_1 — 6-prong tube socket.
- RFC_1 — 2.5-mh. r.f. choke.
- Ry_1 — 6.3-volt s.p.s.t. relay.
- Ry_2 — 6.3-volt heavy-duty starting relay.
- S_1 — S.p.s.t. toggle on dashboard.

Strays

It was a case of life or death when VQ4CO, Nairobi, and W8LIO of Dorset, Ohio, set an amateur radio chain reaction in motion on the 20-meter 'phone band in mid-May. W4AAM, W4NTZ, W1JCX, W1MB and 5A2TO joined in.

Doctor Gustave H. Hoehn, Seventh-day Adventist missionary-physician, was stricken with polio on May 4th while on duty at Kendu Hospital, 200 miles from Nairobi in Kenya Colony. He continued his work until the 11th when a respiratory paralysis developed. The doctor was quickly transported to a Nairobi hospital where Dr. G. W. Allen, VQ4CO, also a Seventh-day Adventist physician, placed him in a standby "wooden lung." This unit was far from satisfactory and Dr. Hoehn's situation was perilous.

VQ4CO then succeeded in contacting W8LIO who, aided by W4AAM, got word to Seventh-day Adventist headquarters in Washington.

The next step was volunteered by the Surgeon General's Office of the Air Force. A special mission was dispatched by air from Frankfurt, Germany, carrying a portable iron lung and a medical team to Nairobi and thence to the U. S. The 8500-mile trip was completed and at last reports Dr. Hoehn was resting comfortably in Children's Hospital, Boston.

Two-Element Driven Arrays

Adjustable Phasing by a Simplified Method

BY L. A. MOXON,* G6XN

TWO-ELEMENT arrays of the close-spaced parasitic type have achieved a well-deserved popularity in spite of a number of drawbacks, among which are the difficulty of making adjustments after erection, the need for 360-degree rotation, a rather poor front-to-back ratio when adjusted for maximum gain, and the difficulty of making them "multiband." These difficulties can be overcome by driving both elements with a suitable phase difference; although there are no new principles involved it appears that the case for driven *vs.* parasitic arrays is not widely known. The problem of phasing — which is a simple matter if tackled as described in this article — has in the past given rise to a certain amount of difficulty.

Before developing the system described here the author relied for DX contacts mainly on a fixed four-element beam which, aided by steeply-sloping ground, gave very good results over the long route to Australia. However, other directions proved difficult to work. Interest was aroused in the "G8PO antenna" by the large number of VK stations using it, and discussions over the air with GSPO himself, in the person of VK3WU, proved to be the starting point for a detailed theoretical and experimental study of driven two-element arrays.

The GSPO antenna is a two-element driven array with 135-degree phasing and $\frac{1}{8}$ wave spacing. The front-to-back ratio is infinite in theory

• All-driven arrays used by amateurs have almost exclusively been of the type where the phasing is either zero or 180 degrees. Perhaps the principal reason is that such phasings are the easiest to get with certainty. This article describes a method of phasing adjustment, based on a unique property of two parallel elements one-eighth wave apart, that is simple to apply and permits selection of a variety of directional patterns.

and often very nearly so in practice. The theoretical gain is 1 db. less than for a parasitic array and about the same as that of the W8JK antenna. However, the gain is more easily realized since the radiation resistance is nearly four times as high. As the beam is electrically reversible, there is no need to provide more than 180-degree rotation. The phase shift is obtained by having different lengths of feeder to the two elements.

In its original form the G8PO antenna has two main snags; i.e., restriction to single-band operation, and cut-and-try methods of phasing adjustment that do not seem always to lead to equally good results. This is usually due to standing waves on the feeders, and in systems with other than $\frac{1}{8}$ wavelength spacing the situation is further complicated by the fact that, in general, the impedances of the two elements are not equal, and it is therefore more difficult to adjust the individual element currents to the desired values. A theoretical study shows that the impedance inequality does not arise if the transfer impedance (i.e., from one element into the other) is non-reactive. This happens, very conveniently, at about $\frac{1}{8}$ wave spacing, and means that if the elements with their feeders are cut individually to exact resonance and connected in parallel through equal values of reactance the currents in the elements are automatically equal.

Fig. 1 shows calculated curves of power gain and front-to-back ratio plotted against phase angle of the currents in the two elements, for equal current amplitudes in both. These curves are applicable to any 2-element $\frac{1}{8}$ -wave spaced array with driven elements, and it will be noticed that the best gain is obtained with phasing in between that of the W8JK and G8PO systems. The G6XN antenna uses 150° phasing as an optimum compromise between gain and front-to-back ratio. With 150-degree phasing the nominal front-to-back ratio is not as high as with 135-degree phasing, but reference to Fig. 2 shows that the single null directly to the rear (180 degrees on the pattern measured from the optimum direction of radiation) has been replaced by two

* Oak Tree Cottage, Chase Lane, Haslemere, Surrey, England.

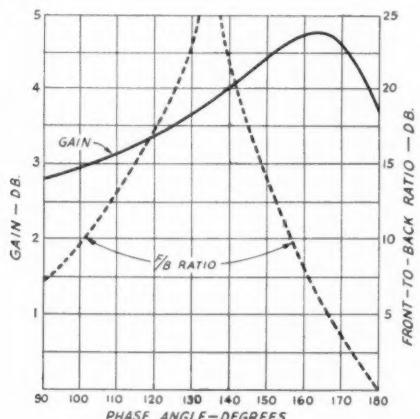


Fig. 1 — Gain and front-to-back ratio as a function of the phase angle between two equal currents in parallel elements spaced one-eighth wavelength, assuming a copper-loss resistance of 2 ohms per element.

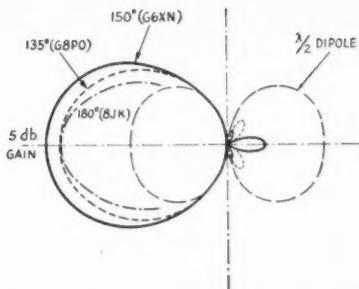


Fig. 2 — Polar diagrams comparing the directive patterns with 135-, 150-, and 180-degree phasing. These figures represent the free-space horizontal-directivity pattern of a horizontal element or array.

nulls at 132 degrees. The nominal figure is therefore misleading, and if we consider the power received "on the back" averaged over 180 degrees on the assumption of uniform angular distribution of interfering stations, the two values of phasing are found to be about equally good.

Phase Shifting with Resonant Feeders

Most readers will be familiar with the W8JK antenna, which makes a convenient starting point for explaining the G6XN method of phasing. If the feeders coming from the two dipoles are joined together, with one pair crossed over, and if r.f. energy is applied to the junction, we have in effect the W8JK system; the arrangement is perfectly symmetrical, the currents in all elements are equal, and the antenna fires equally in both directions.

Let us assume that each dipole, together with its own half-wave feeder, is exactly resonant. The impedance looking into either set of feeder terminals will then be a pure resistance, as indicated in Fig. 3A, and the resistances will have the same value. Shortening one feeder by a small amount, as in Fig. 3B, is equivalent to putting capacitive reactance in series with resistance and the value of reactance will be dependent upon the amount by which the feeder is shortened. Lengthening the other feeder by the same amount introduces inductive reactance of exactly the same amount, and the resistive component of the input impedance is also exactly the same as in the capacitive case.

Consequently, if we leave the feeders joined together but feed "off center" as shown in Fig. 3C, the system is resonant and the same power is delivered to each dipole. Also, the shortened side is given a phase lead and the current in the lengthened side lags. As a result of this and the crossover in one feeder the system fires in the direction of the side toward which the feeder junction has been moved.

The interaction between the elements depends on the phasing between their currents, and not only affects the radiation resistance but introduces reactances of opposite sign into each element which in turn affects the phasing. Since the impedances of the elements themselves

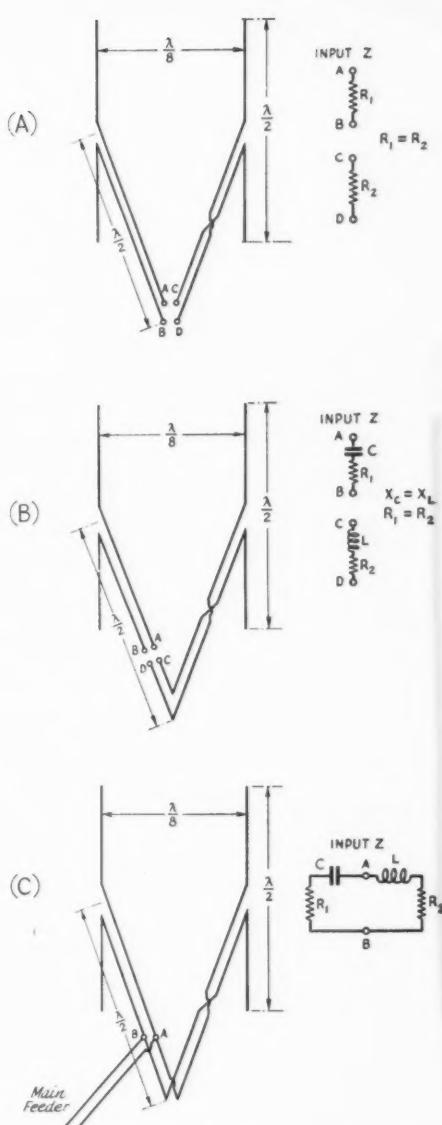


Fig. 3 — Development of the off-center feed method of phasing. The character of the input impedance seen by a transmission line connected to the terminals is shown at the right. As stated in the text, this is based on $\frac{\lambda}{8}$ -wavelength spacing and exact resonance in each element plus its half-wave feeder.

With 150-degree phasing the radiation resistance of each element is about 18 ohms. The resistance seen by the feed line at the junction of the phasing lines is about 10 ohms, the two reflected resistances being in parallel at this point and stepped up a small amount by the phasing lines. With 180-degree phasing each element has a radiation resistance of about 9 ohms, so that the increase in resistance with 150-degree phasing represents a worth-while increase in efficiency.

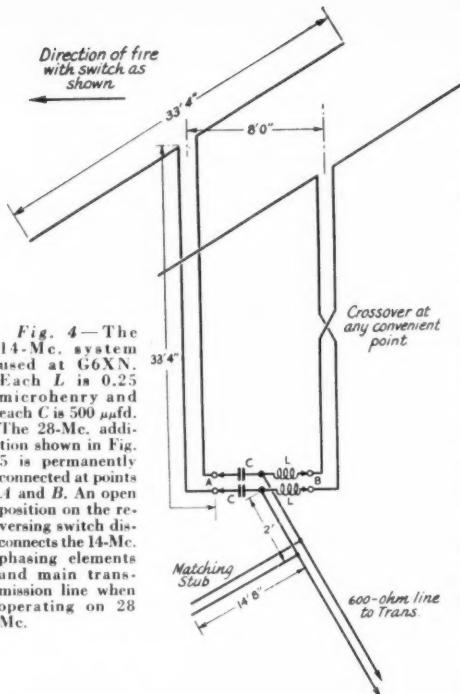


Fig. 4—The 14-Mc. system used at G6XN. Each L is 0.25 microhenry and each C is 500 μ ufd. The 28-Mc. addition shown in Fig. 5 is permanently connected at points A and B . An open position on the reversing switch disconnects the 14-Mc. phasing elements and main transmission line when operating on 28 Mc.

affect the standing-wave ratio on the feeders, and the s.w.r. in turn affects the values of reactance and resistance in the input impedance of the feeders, the proper feed point (junction of feeders) will be farther "off center" than would be the case if changing the current phasing caused no mutual effects between the radiating elements. However, at $\frac{1}{8}$ -wave spacing these effects are practically the same in both elements, so the feeder currents remain equal and the whole system remains resonant, since the phase shifts are equal and opposite.¹

This is true only if the antennas and the connecting line are exactly resonant. For example, if both feeders are too short, the reactance on the capacitive side is increased and the reactance on the inductive side is reduced; the inductive side therefore draws more current. Conversely, excess current on the capacitive side indicates that the feeders are too long. A 20 per cent inequality of currents will reduce the front-to-back ratio (for the G8PO 135-degree phasing) from infinity to about 16 db., although it causes only a slight reduction of forward gain.

¹ In this way a phase angle of 150 degrees is obtained by subtracting 30 degrees from the 180 degrees of the SJK system. As some readers may hasten to point out, one could equally well, in principle, start from 0 degrees (i.e., feeders not crossed over) and add 150 degrees. This is fairly common practice with the G8PO antenna, but with resonant feeders it is quite unworkable except perhaps for spot-frequency working, being too critical. The reason is that in this case the correct feed point is much nearer center than it would be with no interaction, and consequently a very small shift of feed point produces a large phase change.

A Practical System

Reversal of the beam requires the main feeder to be attached at the same distance off center on the opposite side. If preferred, the individual feeders may be kept equal in length, and ordinary lumped capacitances and inductances can take the place of the shortenings and lengthenings. These components can be conveniently mounted on a switch for beam reversal. This is the method used at G6XN, shown in Fig. 4, each feeder being a half-wave long.

The system should ordinarily be adjusted at the mid-frequency of the band or part of the band to be used. If there is an inequality in the feeder currents which favors the capacitive side to the same extent regardless of the switch position, both feeders must be shortened (by the same amount) to the extent required to establish equal currents. Alternatively, if the inductive side is favored the feeders must be lengthened. An adjustment of this type is very likely to be required because end effects make it difficult to calculate the lengths exactly. However, if care has been taken to make the lengths *equal* it is easy to get them *right*.

The effect of unequal lengths is best illustrated by an example. Suppose one feeder is resonant (zero reactance) and that the other is too short, giving a capacitive component of 100 ohms. Also suppose that equal and opposite lumped reactances of 50 ohms each are carried by the switch. In one switch position the net reactance of the short feeder is 150 ohms capacitive and the other is 50 ohms inductive; there is a phase difference but the inductive side draws more current. In the other switch position the net reactance of the short feeder is 50 ohms capacitive and the other feeder is also 50 ohms capacitive. The currents are equal but there is no phase shift, so we have the WSJK system. A signal received from the best direction in the first position will therefore be comparable in the second position, so there appears to be no back-to-front ratio. However, the same test on a signal from the opposite direction will indicate at least some back-to-front ratio. The example ignores the interaction between the elements with the change in phasing on operating the switch, but is in good qualitative agreement with what happens in practice if the lengths are not equal.

Once the feeder lengths are correct, the phasing can be adjusted to the desired value by changing L and C , keeping their reactances equal at the mid-frequency. (Equality can be checked by connecting the two together, to form a simple tuned circuit, independently of the feeder system, and making sure that they resonate at the desired frequency.)

Although there is no simple method available for measuring the phase difference, the phasing can be adjusted by the usual field-strength meter, the L/C ratio being adjusted either for maximum forward gain or to put the nulls at the back at

the desired angle with respect to the line of fire.

If meters are not available for checking the feeder currents a flashlight lamp connected to two probes can be bridged across an inch or two of each feeder in turn. Due to the low impedance the feeders can be handled without serious disturbance of the current or danger of r.f. burns, up to at least 100 watts input and probably much more. It is assumed, of course, that proper care has been taken to prevent any possibility, however remote, of high voltage appearing on the feeders.

At 100 watts input the current in each feeder is about $1\frac{1}{2}$ amperes and the phasing condensers should be rated to stand rather more than this because the currents may be higher during adjustment. Ordinary receiving-type mica capacitors have been used successfully but are not recommended because, even with the author's 100 watts, the current is well in excess of the rating. The capacity values are not unduly critical and normal tolerances are acceptable.

Harmonic Operation

Fig. 5 shows an addition to the system that permits operation on 28 Mc. Since on this frequency the spacing of the two elements in wavelengths is doubled, equal feeder currents are obtained only with unequal values of the phasing reactances for the two sides.

The true center of the system should be determined either by careful measurement of lengths or by making the feeder lengths deliberately too long or too short and adjusting the feed point for current equality; the system is then operating correctly on the principle of the WSJK antenna. A displacement of the feed point will now make the currents unequal, but the lengths can be made correct by the procedure already described. The correct lengths will no longer be exactly resonant and the system as a whole will look reactive, but this can be taken care of by the normal process of matching the main feedline from the transmitter.

A displacement of 6 or 7 inches, as shown in Fig. 5, will be found satisfactory when using a 33-foot long, 8-foot spacing system on 28 Mc., although it is not necessarily the optimum value. The 28-Mc. feeder system has no effect on 14-Mc. operation because it offers a high impedance at a point where the 14-Mc. system has low impedance. When operating on the 28-Mc. band the 14-Mc. feeder is disconnected by means of an open-circuit position on the 14-Mc. beam-reversing switch.

Matching of the transmission line running from the transmitter to the switch is independent of the rest of the system and should be left until last, the matching stubs being adjusted according to standard handbook procedure. Any out-of-balance in this main feeder, such as could be produced for example by one wire running very much closer than the other to some grounded object, must be tracked down and eliminated, since it upsets the relative currents in the resonant feeders and spoils the front-to-back ratio.

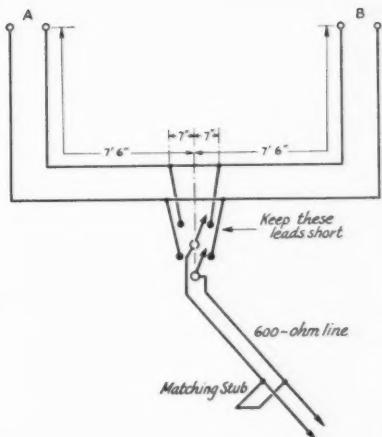


Fig. 5 — Linear phasing system for 28-Mc. operation with the antenna shown in Fig. 4. Points A and B are connected to the corresponding points in Fig. 4. A separate 600-ohm line runs to the transmitter for this band, as shown.

Performance

As the beam is electrically reversible and has a fairly broad forward lobe, about 140-degree rotation is all that need be provided for reasonable all-around coverage; this means that a very simple control system can be used. At G6XN the two elements are supported from a central cross-arm carrying a pair of control wires and hinged to the top of the mast. To prevent the feeders from fouling the guy wires they are brought in to a sort of "neck" on the mast two or three feet below the cross-arm, and then run out again and down at an angle of about 45 degrees to each other, which appears sufficient to prevent any undesirable interaction between them. The feeders have to be brought together at their bottom ends — i.e., at the switch — so that a diamond pattern is formed. Above the neck the feeders are fairly slack, with plenty of spacers, allowing the system to be rotated through the desired angle without short circuits or appreciable mismatching.

The main support for each element is a 10-foot length of 1 by 2 wood, and there are light bamboo extensions carrying wire elements with no additional insulation. This is not a recommended design but merely an example of what one can get away with; the reader no doubt will have better ideas.

Performance was carefully checked against the fixed beam on VK mentioned earlier, which itself had been checked against a dipole. Taking the average of a large number of consistent reports the fixed 4-element beam (theoretical gain about 7 db.) was $1\frac{3}{4}$ "S" points up on the dipole, and the antenna described here was $\frac{3}{4}$ of an "S" point down on the fixed beam, which is in reasonable agreement with the theory on the basis of 4
(Continued on page 120)

Happenings of the Month

NEW A.R.R.L. PRESIDENT

Gentlemen, we give you our new president — Goodwin L. Dosland, W0TSN!



"Dos" brings to the presidency considerable background in amateur organizational and League affairs. Coming to Chicago in the mid-thirties from his Moorhead, Minn., home to practice law, W9TSN joined the Tri-Town Radio Club where his abilities became quickly apparent and he was shortly elected to head the club. In this capacity he became a delegate to the Chicago Area Radio Club Council which, similarly recognizing his leadership qualities, promptly elected him its Chairman. He thereupon was chosen to chairman the Council organization which ran the very successful 1938 ARRL National Convention. What followed was only natural — Dosland became the choice of the Central Division for its director in 1940 and again in 1942. He was, incidentally, a candidate for Congress and although defeated made a surprising show of strength in a district normally heavily leaning to the opposite party.

With the coming of war Dos relinquished his ARRL directorship upon call to active duty, where he first set up and ran the Navy's radio operator training school at Miami (Ohio) University and then at several other schools. Later he got overseas assignments on both war fronts as communications officer. Postwar he returned to Moorhead to take over the law practice of his deceased father, and became W0TSN . . . president of the Red River Radio Club and . . . you guessed it . . . director of the Dakota

Division in 1948, again in 1950, and again the first of this year.

Our new proxy asks us to relay to all amateurs the following note of thanks:

I take this opportunity to express my sincere appreciation and thanks to the many Amateurs throughout our Country who have been so kind as to send me messages, letters of congratulations, and for their kind offers of assistance.

My only regret is that it is physically impossible for me to answer each of the messages and letters individually, and I sincerely trust that each of you will accept this as a personal message of appreciation to you, from your newly elected president.

I know that we will all work together in harmony and unity for the continuance of the best interests of our League and the furtherance of Ham Radio.

73,

Dos, W0TSN
President, ARRL

CANADIAN RECIPROCITY

For quite some time now there has been hanging fire in Washington a treaty between the governments of Canada and the United States which, among other things, would permit the operation by amateurs of one country in the territory of the other. In mid-May, the U. S. Senate finally having ratified, diplomatic representatives of the two governments met to bring the treaty formally into force. This brings a step nearer the time when we in the U. S. shall be able to operate fixed, portable or mobile in Canada, and when our VE associates will be able to do likewise in our country. It appears now that only minimum additional regulation is required before the privilege becomes a reality — perhaps simply taking the form of specific notification blanks filed with appropriate officials. We'll have all the dope for you when available.

NEW F.C.C. AMATEUR CHIEF

William S. Grenfell, W4GF, on May 19th was appointed Chief, Amateur Branch, Public Safety & Amateur Division, Safety & Special Radio Services Bureau, FCC. Thus he fills the vacancy caused by the recent promotion of Ivan H. Loucks, W3GD, to Assistant Chief of the Industry and Commerce Division in the same bureau. Amateurs everywhere, especially those

ARE YOU LICENSED?

- When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

who were more intimately aware of Loucks' capable handling of ham affairs, will wish him continued success.

The new amateur branch chief was bitten by the ham bug in 1929 and became W7GE; he got his Amateur Extra First ticket a year later. An EE graduate of Oregon State College, OM Grenfell worked several years for the state highway and police radio system, then in 1940 joined the rapidly-expanding Radio Intelligence Division of FCC. He served on the radar school staff of the Navy, rejoined FCC in 1946 as engineer in the Frequency Allocation & Treaty Division, subsequently becoming assistant chief in the frequency utilization and requirements branch.

W4GF gets around on most of the ham bands from his home in Falls Church, Va., but likes low power; there's a 6- and 10-meter mobile job of 10 watts, and even the home station runs only 30 watts. He participates in the AREC and the local civil defense net activities.

EXAMINATION SCHEDULE

The Federal Communications Commission will give amateur examinations during the second half of 1952 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: Oct. 3rd

Amarillo, Texas: Sept. 30th

Anchorage, Alaska, 52 Federal Bldg.: By appointment Atlanta, Georgia, 411 Federal Annex: Tuesday and Friday at 8:30 A.M.

Bakersfield, Calif.: Sometime in August

Baltimore, Md., 508 Old Town Bank Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 9:30 A.M.

Bangor, Maine: Sometime in October

Beaumont, Texas, 329 P. O. Bldg.: Monday through Friday, except Thursday only when code test required.

Birmingham, Ala.: Sept. 5th and Dec. 4th

Boise, Idaho: Sometime in October

Boston, Mass., 1600 Customhouse: Monday through Friday 8:30 A.M. to 2:00 P.M.

Buffalo, N. Y., 328 P. O. Bldg.: Thursday

Butte, Mont.: Sept. 18th

Charleston, W. Va.: Sometime in Sept. and Dec.

Chicago, Ill., 826 U. S. Courthouse: Friday

Cincinnati, Ohio: Sometime in August and November

Cleveland, Ohio: Sometime in September and December

Columbus, Ohio: Sometime in July and October

Corpus Christi, Texas: Sept. 10th and Dec. 3rd

Dallas, Texas, 500 U. S. Terminal Annex Bldg.: Monday through Friday



W4GF

Davenport, Iowa: Sometime in July and October
Denver, Colorado, 521 New Customhouse: 1st and 2nd Thursdays and by appointment

Des Moines, Iowa: Sometime in July and October
Detroit, Michigan, 1029 Federal Bldg.: Wed. and Fri.
El Paso, Texas: Oct. 7th

Ft. Wayne, Ind.: Sometime in August and November
Fresno, Calif.: Sept. 19th and Dec. 19th

Grand Rapids, Mich.: Sometime in July and October

Hartford, Conn.: Sometime in September

Hilo, T. H.: Oct. 7th

Honolulu, T. H., 502 Federal Bldg.: Monday through Friday, 8:00 A.M.

Houston, Texas, 324 U. S. Appraisers Stores Bldg.: Tuesday and Friday

Indianapolis, Ind.: Sometime in August and November

Jackson, Miss.: Sept. 10th and Dec. 10th

Jacksonville, Fla.: Oct. 11th

Jamestown, N. D.: Oct. 8th, 10:00 A.M.

Juneau, Alaska, 6 Shattuck Bldg.: By appointment
Kansas City, Mo., 3200 Federal Office Bldg.: Friday, 8:30 A.M., and by appointment

Knoxville, Tenn.: Sept. 18th and Dec. 18th

Las Vegas, Nev.: Sometime in October

Lihue, Kauai, T. H.: Oct. 21st

Little Rock, Ark.: July 16th and Oct. 8th

Los Angeles, 539 Federal Bldg.: Wednesday, 9 A.M., 1 P.M.

Louisville, Ky.: Sometime in November

Manchester, N. H.: Sometime in November

Marquette, Mich.: Nov. 5th, 10:00 A.M.

Memphis, Tenn.: July 11th and Oct. 10th

Miami, Fla., 312 Federal Bldg.: Thursday

Milwaukee, Wis.: Sometime in July and October

Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday and by appointment

Nashville, Tenn.: Aug. 7th and Nov. 6th

New Orleans, La., 400 Audubon Bldg.: Monday through Friday, except Monday through Wednesday only at 8:30 A.M. when code test required

New York, N. Y., 748 Federal Bldg., 641 Washington St.: Monday through Friday

Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required

Oklahoma City, Okla.: July 17th-18th and Oct. 16th-17th

Omaha, Neb.: Sometime in July and October

Philadelphia, 1005 U. S. Customhouse: Mon. thru Fri.

Phoenix, Ariz.: Sometime in July and October

Pittsburgh, Penna.: Sometime in August and November

Portland, Maine: Sometime in October

Portland, Ore., 307 Fitzpatrick Bldg.: Monday through Friday; when code test required, Friday only — 9:00 A.M. for 13 and 20 w.p.m.; 1:00 P.M. for 5 w.p.m.

Reno, Nev.: Oct. 17th

Roanoke, Va.: Oct. 4th

St. Louis, Mo.: Sometime in August and November

St. Paul, Minn., 208 Federal Courts Bldg.: Friday

Salt Lake City, Utah: Sept. 13th and Dec. 13th

San Antonio, Texas: Aug. 7th and Nov. 6th

San Diego, Calif., 15-C U. S. Customhouse: By appointment

San Francisco, Calif.: 323-A Customhouse: Advanced Class Monday through Friday; Novice and Technician Classes, Monday, 8:45 A.M.; General and Extra Class, Friday, 8:45 A.M.

San Juan, P. R., 323 Federal Bldg.: Thursday, and Monday through Friday at 8:00 A.M. if no code test required

Savannah, Ga., 214 P. O. Bldg.: By appointment

Schenectady, N. Y.: Sept. 17th-18th and Dec. 3rd-4th

Seattle, Wash., 808 Federal Office Bldg.: Friday

Sioux Falls, S. D.: Sept. 10th and Dec. 10th; Novice and Technician, 10:00 A.M.; others, 1:00 P.M.

Spokane, Wash.: Sept. 16th

Syracuse, N. Y.: Sometime in July and October

Tallahassee, Fla.: July 12th

Tampa, Fla., 410 P. O. Bldg.: By appointment

Tucson, Ariz.: Sometime in October

Tulsa, Okla.: July 21st-22nd and Oct. 20th-21st

Waluku, T. H.: Oct. 9th

Wash., D. C., 415 22nd St., N. W.: Monday through Friday, 8:30 A.M. to 4:30 P.M.

Wichita, Kan.: Sometime in September

Williamsport, Penna.: Sometime in September and December

Wilmington, N. C.: Dec. 6th

Winston-Salem, N. C.: Aug. 2nd and Nov. 1st

**MINUTES OF 1952 SPECIAL MEETING OF THE
BOARD OF DIRECTORS, AMERICAN RADIO
RELAY LEAGUE,
May 9-10, 1952**

1) Pursuant to due notice, the Board of Directors of The American Radio Relay League, Inc. met in special session at the Hartford Club, Hartford, Conn., on May 9, 1952. The meeting was called to order at 9:30 A.M. EDST with President George W. Bailey in the Chair and the following other directors present:

Wayland M. Groves, First Vice President
 John H. Brabb, Great Lakes Division
 Goodwin L. Dosland, Dakota Division
 John R. Griggs, Southwestern Division
 Alfred C. Heck, Atlantic Division
 Lamar Hill, Southeastern Division
 Kenneth E. Hughes, Pacific Division
 William H. Jacobs, Roanoke Division
 Joseph M. Johnston, Hudson Division
 Wesley E. Marriner, Central Division
 Franklin K. Matejka, Rocky Mountain Division
 A. David Middleton, West Gulf Division
 Percy C. Noble, New England Division
 Alexander Reid, Canada
 R. Rex Roberts, Northwestern Division
 William J. Schmidt, Midwest Division
 James W. Watkins, Delta Division

Also in attendance, as a member of the Board without vote, was General Manager A. L. Budlong. Also in attendance, at the invitation of the Board as non-participating observer, was New England Division Vice-Director Frank L. Baker. There were also present Vice President Francis E. Handy, Treasurer David H. Houghton, Technical Director George Grammer, Assistant Secretaries Richard L. Baldwin and John Huntoon, General Counsel Paul M. Segal and Quayle B. Smith of his office. The meeting was welcomed and briefly addressed by the Chair.

2) On motion of Mr. Brabb, unanimously VOTED that the minutes of the 1951 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary with the addition to Item 45 of those

minutes of the following statement of purpose for resolving the Board into a Committee of the Whole: That the Board resolve itself into a Committee of the Whole to take under consideration the following matters:

a) a report of the Canadian General Manager on the progress that he has made in securing uniformity in the Canadian phone regulations to conform with those of the United States, as requested of the Canadian General Manager in a motion unanimously adopted at the 1946 meeting of the Board;

b) a discussion of the present status of the temporary stewardship of amateur radio activities in Canada contemplated in League By-Laws 28, 29 and 30, with a view of determining whether League activities in Canada can be more directly integrated with the League's divisional organization.

3) On motion of Mr. Brabb, unanimously VOTED that the minutes of the 1952 annual meeting of the Board of Directors are approved in the form in which they were issued by the Secretary.

4) On motion of Mr. Roberts, unanimously VOTED that the annual reports of the officers to the Board of Directors are accepted and the same placed on file.

5) On motion of Mr. Dosland, unanimously VOTED that the Board, having examined its mail action in electing Francis E. Handy as Vice President to serve until May 10, 1952 now ratifies this action and decides to take the aforesaid position as of May 25, 1951.

6) Moved, by Mr. Dosland, that the regular order of business be suspended and that the meeting take up, as Item 4b of the agenda, the ratification and approval of the actions of the Executive Committee during the past year. But, after discussion, during which the General Counsel stated such action is no longer required under the new Charter, with unanimous consent, Mr. Dosland withdrew the motion.

7) On the reception of reports of committees: Without objection, ordered that the report of the Finance Committee goes over for consideration later in the meeting. Mr. Noble read the report of the Planning Committee; whereupon, on motion of Mr. Johnston, unanimously VOTED to receive the report. There was no report from the Policy and Review Committee. Upon the request of Mr. Noble, without objection, ordered that the report of the Constitution Revision



The ARRL Board of Directors and League officials at the annual meeting of the Board in Hartford on May 9th. Seated around the table, *l. to r.*: Director Watkins, Delta; Director Griggs, Southwestern; Director Hughes, Pacific; Vice-President Groves; Director Roberts, Northwestern; Director Schmidt, Midwest; Vice-President Handy; Counsel Smith; President Bailey; General Manager Budlong; Asst. Secretary Huntoon; Treasurer Houghton; Director Reid, Canada; Director Noble, New England; Director Matejka, Rocky Mountain; Director Brabb, Great Lakes; Director Marriner, Central. Rear, *l. to r.*: Vice-Director Baker, New England; Technical Director Grammer; Director Dosland, Dakota; Director Middleton, West Gulf; Director Hill, Southeastern; Director Heck, Atlantic; Director Jacobs, Roanoke; Director Johnston, Hudson; Asst. Secretary Baldwin.

Committee goes over for consideration later in the meeting. Mr. Griggs reported briefly for the Membership and Publications Committee; on motion of Mr. Johnston, unanimously VOTED to receive the report.

8) On motion of Mr. Hill, unanimously VOTED that the annual reports of the directors to the Board of Directors are accepted and the same placed on file.

9) At this point, supplementary oral reports were rendered by the officers of the League. During the course of the General Manager's report, he and the General Counsel discussed at length the relationship of the League to the various government agencies in Washington dealing with amateur matters.

10) During the course of the above, the Board was in recess from 11:14 A.M. to 11:24 A.M.

11) On motion of Mr. Dosland, unanimously VOTED that the regular order of business be suspended and that the meeting proceed to take up at this time Item 14 of the agenda, Consideration of recommendations of the Constitution Revision Committee.

12) After discussion, moved, by Mr. Dosland, that the following By-Laws of The American Radio Relay League, Inc., be adopted

[The text of the By-Laws appears in a separate article in this issue and is not repeated here. — Ed.]

The yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. All the directors voted in the affirmative, except the President and First Vice-President, who abstained as required. So the By-Laws were ADOPTED.

13) Moved, by Mr. Noble, to adopt the following resolution: The Board of Directors, having, at its 1951 meeting, effectuated Amended Articles of Association and having at the present meeting adopted new By-Laws, be it now RESOLVED, that the Constitution and By-Laws of The American Radio Relay League, Inc., as published June 1, 1951, and entitled, "Constitution and By-Laws of The American Radio Relay League, Inc., Revised to June 1, 1951," be and they hereby are repealed, effective July 1, 1952. The yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 16; nays, 0. All the directors voted in the affirmative except the President and First Vice-President, who abstained as required. So the resolution was ADOPTED.

14) On motion of Mr. Noble, the following Rules and Regulations Concerning American Radio Relay League Constitutions were unanimously ADOPTED:

[The text of the regulations appears along with the Charter and By-Laws in another article in this issue, and is not repeated here. — Ed.]

15) On motion of Mr. Noble, the following Rules and Regulations Concerning Affiliated Societies were unanimously ADOPTED:

[The text of the regulations appears along with the Charter and By-Laws in another article in this issue, and is not repeated here. — Ed.]

16) Moved, by Mr. Noble, the adoption of the following resolution: Be it RESOLVED that, pursuant to Article 7 of the Amended Articles of Association, F. E. Handy is hereby designated and appointed a member of the Executive Committee to serve as such for the 53-week period ending May 16, 1953. The yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative except the President, who abstained as required, and the First Vice-President. So the resolution was ADOPTED.

17) Moved, by Mr. Noble, the adoption of the following resolution: Be it RESOLVED that, pursuant to Article 7 of the Amended Articles of Association, David H. Houghton is hereby designated and appointed a member of the Executive Committee to serve as such for the 53-week period ending May 16, 1953. The yeas and nays being ordered, the question was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative except the President, who abstained as required, and the First Vice-President. So the resolution was ADOPTED.

QSL MANAGERS THANKED BY BOARD

At its May meeting the League's Board of Directors took time to express its thanks to the QSL Bureau Managers in the U. S., its possessions, and Canada. These Bureau Managers have continued to give unstintingly of their time and energy in order that the DX cards from overseas stations may be delivered to the addressees. We can all add our thanks to those of the Board by writing a note of appreciation to the Manager who serves our particular call area. And when you send him that note, don't forget to include at least one stamped and self-addressed envelope which is about 4 by 9 inches in size. Your call letters should be printed in the upper left-hand corner, with your name and address in the usual place. If you will send these envelopes, your QSL Bureau Manager will be very grateful.

18) The Board was in recess for luncheon from 12:05 P.M. to 1:34 P.M.

19) On motion of Mr. Jacobs, after discussion, unanimously VOTED that the General Manager is authorized to reimburse SCMs for travel within the limits of the division in which they reside, provided this meeting is called by the director of the division for the purpose of considering League matters, and provided further that SCMs shall attend no more than one such meeting each calendar year and that said trips shall be considered one of the SCM annual trips otherwise provided for elsewhere by the Board, and provided further that nothing in this authorization shall permit travel into or out of the continental United States as a unit, or Canada as a unit.

20) Moved, by Mr. Jacobs, that By-Law 6, just adopted, be amended to read as follows:

6. Every officer, director and vice-director of the League shall serve and continue in office until his successor shall have been elected and qualified; provided, however, the President shall not succeed himself in office a second time.

The yeas and nays being ordered, the question was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 11; yeas, 3; nays, 13. Those voting in the affirmative were Messrs. Griggs, Jacobs and Middleton; all the other directors voted in the negative except the President and First Vice-President, who abstained as required. So the motion to amend was rejected.

21) Moved, by Mr. Matejka, that the Secretary of the League be instructed to request, in the name of the American Radio Relay League, a suballocation in the 7-Megacycle band for 'phone from 7225 to 7300 kc. Moved by Mr. Dosland, that the motion be amended to strike out the frequencies 7225-7300 kc. and substitute therefor 7200-7300 kc. The yeas and nays being ordered, upon request, the amendment was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 15 nays, 1. All the directors voted in the affirmative except Mr. Hughes, who voted opposed, and the President, who abstained as required, and Mr. Reid, who also abstained. So the amendment was ADOPTED. The question then being on the motion as amended, the same was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 16; nays, 0. All the directors voted in the affirmative except the President, who abstained as required, and Mr. Reid, who also abstained. So the motion, as amended, was ADOPTED.

22) Moved, by Mr. Matejka, that the Secretary be instructed to request of the Federal Communications Commission, in the name of the American Radio Relay League, that the 'phone sub-band at 3.8 Megacycles be extended to

read 3750-4000 kc. But, after discussion, unanimous consent being given, Mr. Matejka withdrew his motion.

23) On motion of Mr. Dosland, unanimously VOTED, at 2:25 P.M., that the Board does now resolve itself into a Committee of the Whole in order to consider the entire subject of frequency allocations and suballocations in the amateur bands in the United States. The Chair appointed himself Chairman of the Committee of the Whole. The Board, sitting as a Committee of the Whole, was in recess from 3:37 P.M. to 3:46 P.M. and from 5:37 P.M. to 5:42 P.M. The Committee arose at 5:42 P.M. and Mr. Bailey, as Chairman of the Committee, laid before the Board the report of the Committee.

24) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the frequencies 21,250-21,450 be authorized for 'phone operation.

25) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the possession of Advanced Class license, or higher, be continued as a requirement for 'phone operation in the 3.8- and 14.2-Mc. sub-bands.

26) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that issuance of the Advanced Class license be continued after December 31, 1952.

27) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the present operating privileges for Novice licensees in the 26.96-Megacycle band be retained.

28) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that A-8 emission be authorized for the frequencies 51-54 Megacycles.

29) On motion of Mr. Matejka, VOTED, 14 votes in favor to 2 opposed, Mr. Reid abstaining, that the General Manager be directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that f.s.k. emission, teletype only, be authorized on the sub-band 7150-7200 kc.

30) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the frequencies 7150-7200 kilocycles be authorized for Novice operation, A-1 emission only.

31) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that Novice Class licensees be authorized to operate on the frequencies 51-53 Megacycles, A-1 and A-3 emission, for a trial period of one year.

32) On motion of Mr. Matejka, unanimously VOTED, Mr. Reid abstaining, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, to amend the amateur rules so that the 'phone authorization in the 28-Megacycle band shall read 28,250-29,700 kc.

33) The Board was in recess for dinner from 5:57 P.M. to 7:51 P.M.

34) Moved, by Mr. Matejka, that the General Manager be directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that the 'phone suballocation in the 3.8-Megacycle band be amended to read 3750-4000 kc. The yeas and nays being ordered, on request, the question was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 7; nays, 9. Those voting in the affirmative were Messrs. Dosland, Hill, Matejka, Middleton, Noble, Watkins and Groves; those voting in the negative were Messrs. Brabb, Griggs, Heck, Hughes, Jacobs, Johnston, Marriner, Roberts, and Schmidt. The President abstained.

as required, and Mr. Reid also abstained. So the motion was rejected.

35) Moved, by Mr. Matejka, that the General Manager is directed to request of the Federal Communications Commission in the name of the American Radio Relay League, that mobile 'phone operation be authorized on the frequencies 3775-3800 kc. Moved, by Mr. Jacobs, to amend the motion so that 'phone is authorized on these frequencies with no reference to mobile. The yeas and nays being ordered, on request, the question on the amendment was decided in the negative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 7; nays, 9. Those voting in the affirmative were Messrs. Dosland, Jacobs, Matejka, Middleton, Noble, Watkins, and Groves; those voting in the negative were Messrs. Brabb, Griggs, Heck, Hill, Hughes, Johnston, Marriner, Roberts, and Schmidt. The President abstained and Mr. Reid also abstained. So the motion to amend was rejected. The question then being on the original motion, and the yeas and nays being ordered, on request, the same was decided in the affirmative: Whole number of votes cast, 16; necessary for adoption, 9; yeas, 14; nays, 2. All the directors voted in the affirmative except Messrs. Griggs and Hughes; the President abstained, as required, and Mr. Reid also abstained. So the motion was ADOPTED.

36) The Board of Directors was informed by Mr. Hill of the death on April 17, 1952 of Dr. Orville Cheatham, W4DU, of Jacksonville, Florida, a friend to amateur radio and a true friend to the many radio amateurs who had the privilege of his acquaintance or the joy of his friendship. Whereupon, on motion of Mr. Hill, the following resolution was unanimously ADOPTED:

RESOLVED: That on behalf of amateur radio the Board expresses its deep regret at the loss of Doctor Cheatham, a true leader, a true friend, and a true amateur; that the Board expresses its deep and sincere sympathy for Doctor Cheatham's family; and that the President of the League is requested to express these sentiments to Doctor Cheatham's family and to transmit to them a copy of this resolution.

37) Mr. Middleton read a letter from Mr. C. Fermaglich, the SCM of Southern Texas, requesting, on behalf of the Houston Amateur Radio Club and members of the West Gulf Division, that the Board of Directors of the American Radio Relay League authorize a National Convention of the League in Houston in 1953. Whereupon, on motion of Mr. Middleton, unanimously VOTED that the Board of Directors authorizes the Houston Amateur Radio Club to hold an ARRL National Convention in Houston in 1953, subject to the terms of a satisfactory contract to be executed between the Club and the League, similar in tenor to that for previous National Conventions.

38) Moved, by Mr. Middleton, that the Editor of QST be instructed to publish in QST, in the earliest issue possible, any material forwarded to QST by any ARRL elected official, when such material pertains to any phase or phases of Amateur Radio or the ARRL. Such material (not more than 250 words per issue) to be signed with the name and title of the authoring ARRL official. After discussion, on motion of Mr. Dosland, VOTED to amend the motion by prefacing it with the words "When so ordered by the Board of Directors". The question then being on the motion as amended, the same was unanimously ADOPTED.

39) Moved, by Mr. Middleton, that the ARRL Headquarters Staff establish and publicize a policy on TVI by means of a nationwide educational program directed to TV manufacturers, servicemen and repairmen, and TV set users, such a program to be implemented by suitable literature together with other media that will assist said program. Moved by Mr. Johnston to amend the motion by striking out the text and substituting therefor that the Board commends the management staff of ARRL for the excellent manner in which it has attacked the TVI problem; but there was no second, so the motion to amend was lost. On motion of Mr. Dosland, VOTED to amend the motion by deleting the words "That the ARRL Headquarters Staff" and substituting therefor "That the Board commends the Headquarters Staff on the work that it has done and directs it to continue to." The question then being on the motion as amended, the same was unanimously ADOPTED.

40) On motion of Mr. Middleton, the following reso-

lution was unanimously ADOPTED:

RESOLVED, that the Board of Directors of the American Radio Relay League does hereby express to Mr. Phil Rand, W1DBM, its thanks and appreciation for his untiring efforts on behalf of amateur radio in connection with combating TVI.

41) Moved, by Mr. Middleton, that the ARRL Technical Director be instructed to make (or to secure a qualified testing laboratory) a thorough evaluation of both high-pass and low-pass TVI filters currently available on the commercial market and that this data be published without delay in *QST*, referring to various filters as "Type A — low-pass three-section M-derived" etc. together with their respective block diagrams. No mention shall be made of the manufacturer's type or brand name in ARRL publications in this connection.¹³ And that this program of investigation and publication of the results be continued in order to acquaint the buying amateur with the technical facts regarding the relative merits of this type of manufactured units as compared with those ham-built units described in ARRL publications. But there was no second, so the motion was lost.

42) Moved, by Mr. Middleton, that this Board of Directors direct and order that full and complete lists of all affiliated clubs in any and all divisions be furnished to any group of ten (10) or more ARRL members or to any affiliated club upon request, if the request is accompanied by a statement that the lists will not be used for commercial purposes. But there was no second, so the motion was lost.

43) Moved, by Mr. Middleton, that the Editor of *QST* be instructed to print the once familiar and time-honored ARRL guarantee covering space advertised products in each issue of *QST*; but unanimous consent being given Mr. Middleton, with the permission of his second, withdrew the motion.

44) Moved, by Mr. Middleton, that the ARRL sponsor a "Technical Scholarship" which will lead to a year's paid employment in the ARRL Laboratory at Headquarters for an amateur who has not yet reached his twenty-first birth date and who, in the decision of the judges (to be selected by the Board of Directors), has most clearly demonstrated his inherent ability, interest and enthusiasm towards the technical side of Amateur Radio, through his contribution to Amateur Radio in the year 1952, such "Technical Scholarship" to be a continuing yearly award with job offers made to the winners. On motion of Mr. Dosland, VOTED to table the motion and refer it to the Planning Committee relative to the cost of such a program.

45) Moved, by Mr. Griggs, that the ARRL Technical Director be instructed to make (or to secure from a qualified testing laboratory) an immediate and searching investigation of representative types of TV receivers relative to their capability to reject amateur signals and also to determine the extent of their radiated interference as affecting amateur communications, and that the Editor of *QST* be instructed to supply the results of these unbiased engineering reports to League members upon request. After discussion, moved by Mr. Dosland to amend the motion to read that the General Manager of the League have the League's technical staff, to the extent practicable, make an investigation of representative types of TV receivers, etc., with the engineering reports referred to be supplied League members upon request, the information to be cleared through the office of the General Counsel. But the motion to amend was rejected, 4 votes in favor to 7 opposed. The question then being on the original motion, the yeas and nays being ordered upon request, the same was decided in the negative: Whole number of votes cast, 17; necessary for adoption, 9; yeas, 3; nays, 14. All the directors voted in opposition except Messrs. Griggs, Middleton and Watkins, and the President, who abstained as required. So the motion was rejected.

46) On motion of Mr. Heck, unanimously VOTED that the General Manager of the League is instructed to conduct a continuing survey looking toward expansion of maritime mobile privileges.

47) On motion of Mr. Heck, the following resolution was unanimously ADOPTED:

RESOLVED, that the Board of Directors, on behalf of Amateur Radio request its Secretary to convey to the Chairman of the Federal Communications Commission this expression of their appreciation of the

meritorious and unstinting service of the members of the Field Engineering and Monitoring Bureau of the Commission.

48) On motion of Mr. Marriner, unanimously VOTED that the Technical Editor of *QST* is commended on the excellence of the technical material appearing in *QST* during the past year. Mr. Grammer spoke briefly in appreciation. (Applause)

49) Moved, by Mr. Marriner, that *QST* should, from time to time, stress the existence of the Ragchewers Club, A-1 Operators Club, etc., and the requirements for them, etc. But there was no second, so the motion was lost.

50) On motion of Mr. Johnston, the following resolution was unanimously ADOPTED:

WHEREAS, on March 21, 1952, Ralph T. Beaudin would have completed twenty-five years of continuous service to the American Radio Relay League, as Assistant Circulation Manager and more recently also as Production Manager, and

WHEREAS, the Board of Directors of the American Radio Relay League is deeply grieved at his sudden passing on February 15, 1952,

Now, therefore, be it RESOLVED, that the Board of Directors, meeting at Hartford, Connecticut, on May 9, 1952, in recognition of Ralph T. Beaudin's untiring efforts on behalf of the League, does hereby express its deep appreciation of his loyalty, fidelity and intelligent devotion to the best interests of amateur radio, and expresses its deep sense of loss at his passing.

51) On motion of Mr. Johnston, the following resolution was unanimously ADOPTED:

Whereas the QSL Bureau Managers of the United States and Canada have continued to render valuable service to their fellow amateurs, without material compensation, BE IT RESOLVED that the Board does hereby commend the QSL Bureau Managers for their faithful service.

52) The Board was in recess from 9:37 P.M. to 9:45 P.M.

53) Mr. Roberts' position on the agenda having been reached, he reported to the Board receipt of the following resolution:

RESOLVED, by the sixth National ARRL Convention assembled at Seattle, July 29, 1951 that the ARRL requests of the Federal Communications Commission what should be considered good engineering standards in the reduction of TVI.

On motion of Mr. Dosland, unanimously VOTED that this resolution be received and filed.

54) On motion of Mr. Jacobs, after discussion, unanimously VOTED that the General Manager is hereby authorized to reimburse division directors for actual expenses incurred by them during the year 1952 in the proper administration of ARRL affairs in their respective divisions up to amounts as follows:

Canadian Director	\$ 350
Atlantic Division Director	600
Central Division Director	850
Dakota Division Director	600
Delta Division Director	800
Great Lakes Division Director	800
Hudson Division Director	700
Midwest Division Director	800
New England Division Director	300
Northwestern Division Director	800
Pacific Division Director	600
Roanoke Division Director	200
Rocky Mountain Division Director	400
Southeastern Division Director	600
Southwestern Division Director	950
West Gulf Division Director	1000

55) On motion of Mr. Griggs, unanimously VOTED that the General Manager is hereby authorized to pay expenses for the operation of ARRL committees during the year 1952 but not to exceed the amounts as follows:

Planning Committee	\$2000
Finance Committee	\$ 200

56) On motion of Mr. Roberts, unanimously VOTED

that, to continue the Board policy of reimbursing SCMs and QSL Managers for certain travel via the shortest commonly-traveled route, the General Manager is hereby authorized to pay during the year 1952 a total amount not exceeding three thousand dollars (\$3000) under the conditions specified in Minute (52) of the 1951 meeting of the Board.

57) On motion of Mr. Roberts, unanimously VOTED that the Constitution Revision Committee, its work having been completed, is hereby dissolved with the deep appreciation of the Board for the excellent work done in revising the League's Charter and By-Laws.

58) On motion of Mr. Roberts, unanimously VOTED that the General Manager is hereby authorized to reimburse, at the rate of seven and a half cents per mile or actual rail or bus fare, Section Emergency Coordinators to a maximum of ten trips each per year per section, throughout their respective sections in United States and Canadian territory only, via the shortest commonly-traveled route for the pre-arranged meetings or contacts, for the purpose of close contact with Emergency Coordinators and through meetings, selling clubs and individuals on the necessity for emergency corps work, and contacting duly constituted civil defense officials, relief and appropriate local agencies, subject to submission and approval of a full report to the Communications Manager. If one SEC replaces another and the section quota of trips has been exhausted by his predecessor, he may with a written concurrence of his director and the Communications Manager request advance approval of subsequent reimbursement for specific travel (but not more than five trips) under the provisions above. In cases where official meetings or other official contact with state or regional civil defense authorities makes travel for attendance in adjacent sections especially desirable, an SEC may in each case be authorized such travel exceptionally, as one of the authorized trips, but only after coordination with the division director and by advance permission of and at the discretion of the ARRL Communications Manager; no reimbursement in such special cases, however, may cover any travel to points more than 100 miles beyond the boundary of his own section. The total amount covered by this motion for travel during the year 1952 shall not exceed two thousand five hundred dollars (\$2,500).

59) On motion of Mr. Griggs, unanimously VOTED that the General Manager is hereby authorized to pay, during the period between January 1, 1953 and the 1953 meeting of the Board, expenses against usual authorizations for administrative and committee operations, in no greater amounts than 1952 authorized amounts.

60) On motion of Mr. Griggs, the Board recessed at 10:35 P.M. under order to reassemble at 9:30 A.M. on the morrow. The Board reassembled at the same place on May 10, 1952 and was called to order by the Chair at 9:36 A.M. with all directors and other persons herein before mentioned in attendance except Messrs. Segal and Smith, who entered the meeting at 9:55 A.M.

61) Moved by Mr. Middleton, that the Editor of *QST* be instructed to print the once familiar and time-honored ARRL statement covering space-advertised products in each issue of *QST*. On motion of Mr. Reid, VOTED 13 votes in favor to 3 opposed to amend the motion so that it shall read that the Editor of *QST* be instructed to print the once familiar and time-honored ARRL statement covering space advertised products from time to time at his discretion, subject to the approval of the League's General Counsel. The question then being on the motion as amended, the same was ADOPTED.

62) On motion of Mr. Brabb, unanimously VOTED that, Whereas the majority of Canadian amateurs have indicated their unselfish cooperation by refraining from operation in the portion of the spectrum 3725-3750 kilocycles, it is the sense of this Board that it expresses its thanks.

63) On motion of Mr. Brabb, unanimously VOTED that this Board expresses its thanks to the League's General Counsel for his excellent handling of recent municipal ordinance cases affecting Amateur Radio.

64) On motion of Mr. Brabb, unanimously VOTED that the Board hereby expresses its deep appreciation for the services being performed in the name of Amateur Radio and the League by the Section Communications Managers, Section Emergency Coordinators, Emergency Coordinators, and members of Emergency Radio Nets.

65) Mr. Hughes drew the attention of the Board to the

fact that Treasurer David H. Houghton had this year completed 30 years of service with the League, whereupon all those present tendered Mr. Houghton a standing vote of applause.

66) On motion of Mr. Groves, unanimously VOTED that the Board does hereby express its appreciation to John Cann, W1RWS, of the Headquarters staff for the efficient manner in which he has been handling DXCC awards.

67) Moved, by Mr. Griggs, that the Board direct the Communications Manager to establish an appointive field position of interference coordinator in each section, to be appointed by the SCM. After discussion, moved, by Mr. Hughes, to amend the motion to specify that such appointments shall be made only in areas where such appointments have not already been made. After further discussion, on motion of Mr. Matejka, unanimously VOTED to further amend the motion to provide that the Communications Manager is to give consideration to such an appointive position in preparing the Rules and Regulations of the Communications Department. The question then being on Mr. Hughes' amendment, as amended, the same was unanimously ADOPTED. The question then being on the original motion as amended, the same was unanimously ADOPTED.

68) On motion of Mr. Jacobs, the following resolution was unanimously ADOPTED:

RESOLVED, that this Board sincerely appreciates the loyalty of the individual employees of the League at our Headquarters offices and does hereby express our sincere thanks to them for their valued services to the League and Amateur Radio.

69) Moved, by Mr. Jacobs, that a committee of two directors be appointed to study the many questions and requests from clubs and individuals pertaining to contests, etc., conducted by the League and report its recommendations to the General Manager prior to December 31, 1952. For the purpose of financing this committee one thousand dollars is hereby appropriated; monies made available shall be used for the expense incurred by directors only. But, after discussion, the motion was rejected.

70) On motion of Mr. Johnston, VOTED, 13 votes in favor to 3 opposed, that following the completion of directors' motions, the regular order of business be suspended and item 19 on the agenda, election of officers, be made the next order of business.

71) On motion of Mr. Noble, unanimously VOTED that affiliation is granted to the following societies:

Texoma Amateur Radio Club, Sherman & Denison, Texas
Richland Amateur Radio Club, . . . Richland, Washington
Augusta Emergency Amateur Radio Unit, Augusta, Maine
The Band Hoppers Radio Club, . . . Ferguson, Missouri
Longhorn Amateur Radio Club, . . . Austin, Texas
Stonewall Jackson Amateur Radio Club, Inc., Weston, West Virginia

Florence Amateur Radio Club, . . . Florence, South Carolina
Calumet High Radio Club, . . . Calumet, Michigan
Haverford Township Emergency Radio Net, Havertown, Pennsylvania

Minnedosa Amateur Radio Club, Minnedosa, Man., Canada
Needham Amateur Radio Association, Needham, Massachusetts

Carrollton Radio Club, Carrollton, Georgia

72) On motion of Mr. Noble, unanimously VOTED that in the event Board action on new draft language comprising the Rules and Regulations of the Communications Department is not completed by July 1, 1952 that the Communications Manager be guided in conducting SCM elections and other matters by the policies presently effective in old By-Laws 6 to 9.

73) On motion of Mr. Noble, unanimously VOTED that the Board of Directors, to continue to acquaint itself with the current status of field organization and radio operating matters, will continue to expect to receive an annual report on these matters from the Communications Manager.

74) The Board was in recess from 10:53 A.M. to 11:00 A.M.

75) Proceeding now to the election of officers, the Chair then APPOINTED Messrs. Hill and Matejka as tellers.

76) Nominations for President being in order, Mr. Johnston nominated Mr. Bailey, Mr. Griggs nominated Mr. Dosland, Whereupon, on motion of Mr. Brabb, unanimously VOTED that the nominations are closed.

(Continued on page 120)

YL NEWS and VIEWS

CONDUCTED BY
ELEANOR WILSON,* WIQON

IN response to requests, when space permits, we plan to publish the regular operating times and frequencies of YLs who handle large amounts of traffic and/or who are very active in one way or another on the amateur bands. There are several reasons why it may be of value to know where and when these YLs operate — to facilitate the exchange of traffic; to work toward WAS/YL; to observe some good operating procedure; or to enjoy a bit of rag-chewing. Most of the YLs who are on extensively are first-class operators — efficient, courteous, and capable!

We'll launch the project with information about the following well-known YLs who operate several hours each day (all times EST):

W1OAK — Ann Chandler: 3740 kc. — 1815, Mon. thru Fri.; 3520 kc. — 1900, Mon. thru Fri.; 3605 kc. — 1945 and 2130, Mon. thru Fri.

W2BNC — Helen Law: 3970 kc. — 1645 to 1800, Mon. thru Fri.; 3595 kc. — 2000 to 2045, Wed.; 14,255 kc. — 1200 to 1500, Mon. thru Fri.

W2BTB — Jeanne Walker: 3845 kc. — 0545 (!) to 1200; 3920 kc. — early afternoons; 3370 kc. — 1700 to 0100 (the next day!).

W2RUF — Clara Reger: 7150-7200 kc. — Days, Mon. thru Fri.; 3615 kc. — Evenings, Mon. thru Fri.

W3CUL — Mae Burke: (Record traffic-handler Mae wrote that a listing of all her schedules and frequencies would consume the YL Department's space allotment for this issue!)

W3NHI — Marion Kurtzner: 7120 kc. — 1030; 7280 kc. — 1230; 3610 kc. — 1830; 3620 kc. — 2400.

W9JUJ — Peggy Coulter: 7100-7150 kc. — 0630 to 1630; 3656 kc. — 1700 on.

In future columns, space permitting again, the regular operating times and frequencies of YLs will simply be listed without introduction. We don't mean to overlook anybody, so let us know whom you think should be added to the list.

Keeping Up with the Girls

WN0FOU, Rosemary Parenteau, and WN0FXK, Helen Young, both patients at O'Reilly Veterans Hospital in Springfield, Missouri, would like to hear from other YLs. (Continued on page 124)

* YL Editor, QST. Please send all contributions to WIQON's home QTH: 318 Fisher St., Walpole, Mass.

Pilots Alice Picard, W2WP, left, and Helen Wright, WN1UPZ, shown here with Alice's Cub, are two of a number of YLs who successfully mix amateur radio and flying. Alice received her ham ticket in 1930 and became one of fewer than 100 YLs in the world. While Helen is a comparatively new YL, she has an extensive background in various radio organizational activities.



Here are nine YLs who let the world know that the ten-meter band is open to the Canal Zone. These KZ5 YLs are charter members of the Canal Zone QR Marys, a club recently organized to coordinate and further KZ5 YL activity. Besides DXing on ten, the girls handle traffic and conduct periodic net drills. Seated, l. to r.: Grace, KZ5DG, club secretary; Angie, KZ5AC, president; Lois, KZ5LM, v.p. Standing, l. to r.: Bess, KZ5CN; Dee, KZ5NN; Bess, KZ5BM; Kay, KZ5KA; Carol, KZ5GQ; and Martha, KZ5ML, club activities.



These are members of the newly-formed Ladies Amateur Radio Klub (LARK) of Chicago. The girls meet on the last Thursday of each month, and every Tuesday at 10:00 p.m. CST on 29 Mc. they conduct a ten-meter net. Bottom row, l. to r.: Bernice, WN9RWV; Helen, W9FZO; Grace, W9GME; and WN9SEZ. Top row, l. to r.: Gladys, W9MYC; Chris, W9LOY; Bobby, W9KXL; Helene, W9BCB; and Verona, WN9QYG.



On the Air with SINGLE SIDEBAND



ANY of the readers of this column who don't know how to tune in a s.s.b. signal (and we certainly hope there are a few, attracted by the superior quality of the prose!) can get some practice in our own 21-Mc. band. There are some Argentine s.s.b. commercial stations still operating there, in English, and their signals offer excellent opportunities for practice. They run a slight residual carrier. In case you don't know the technique, first center the receiver on the signal by tuning for maximum "kick" of the S meter. Then reduce the r.f. gain, switch off the a.v.c., switch on the b.f.o., run the audio volume at maximum and increase the r.f. gain until you begin to hear the beat against the residual carrier. Slowly tune the b.f.o. control until you have zero beat with the residual carrier, and you will hear the speech. Of course most amateur s.s.b. signals don't use a residual carrier, and when you come to them you have to tune the b.f.o. carefully until the speech is the most understandable. The Argentine signals allow you to demonstrate receiver overload, too, since if you let the r.f. gain run too high in the receiver, you can't possibly clear up the speech. But reducing the r.f. gain to a correct setting will eliminate the overload, just as it will with amateur signals. These signals are usually pretty potent, so when you tune into them with the a.v.c. on and the r.f. gain wide open, you will observe the same receiver-generated "splatter" that has been reported on 75 and 20 on one or two occasions.

In strictly amateur circles, a nice note from W5PWO/4 tells about Tennessee's W4CVM and W4ONX. CVM uses an Edmunds (W1JEO) exciter ending in a pair of 807s that drive a linear 304TL, and ONX uses an Edmunds into a pair of 6146s driving a pair of 304TLs. W5PWO/4 will be on soon with an Edmunds ending in an 829B. All rigs use voice control.



Here is Bob Ehrlich, W2NJR, of West Orange, N. J., and his neat shack and rig. The rack at the right houses the 833A final and its power supplies, while on the table the left-hand rack carries the exciter and its 807 driver-amplifier, with a BC-348 receiver in the right-hand rack. The table at the rear carries a 'scope and some 2-meter gear (not s.s.b., yet). Bob is one of the early-birds in s.s.b., and authored that excellent article on linear amplifiers in the May issue.

First s.s.b. maritime-mobile rig we've heard of is operated by Bob Wilson, W9RNL, aboard the *SS North American* on the Great Lakes. Prompted by receiving experiences last year, when s.s.b. was found to be copyable when all 75-meter a.m. signals were completely taken out by QRN, both natural and man-made, W9RNL/MM uses a crystal-filter job involving features from several sources. The filter itself is a single-section lattice à la Weaver-Brown, following a Pierce 6AU6 crystal oscillator and 6AK5s balanced modulator. The speech is 6AU6-6C4-12AU7, the 12AU7 screen-modulating the 6AK5s across 27,000-ohm resistors. Voice control, taken off the 12AU7 plates, consists of a 6AL5 rectifier and 6AG5 control tube that works a 5000-ohm relay. Following the filter a 6AG7 mixer (and 6J6 crystal oscillator) converts to 75 and drives a push-pull 6AG7 output amplifier. The single-lattice filter was found to be adequate for the job when good isolation between input and output circuits is

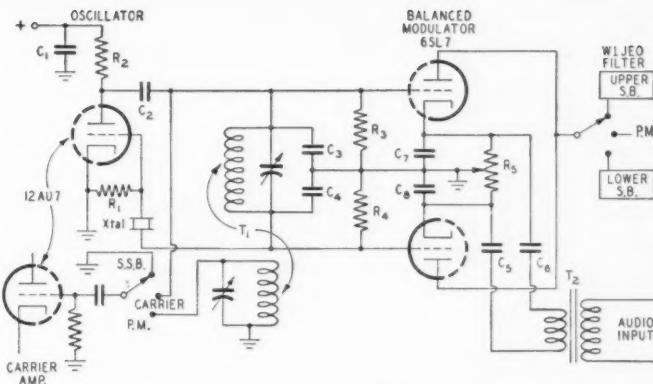


This is the gang that did such a splendid job of presenting s.s.b. to the multitudes at the recent R.S.G.B. Exhibition, and the equipment that was displayed and demonstrated. L. to r.: G3BVA, G2NX, G3CWG, G8RC, G3CU, G3FHL, and G3FDG.

QST for

F i g . 1 — T h e
VE6CN revision of the
Edmunds exciter.

C₁ — 8-μfd. 450-volt
electrolytic.
C₂, C₅, C₈ — 0.005-
μfd. mica.
C₃, C₄ — 100-μfd.
mica.
C₆, C₇ — 0.25-μfd. pa-
per.
R₁ — 47,000 ohms.
R₂ — 33,000 ohms.
R₃, R₄ — 0.15 meg-
ohms.
R₅ — 2500-ohm po-
tentiometer.
T₁ — 450-ke. i.f. trans-
former.
T₂ — Small Class B in-
put trans-
former.



maintained, and it is simple to align when a balanced modulator is used. Look for W9RNL/MM around 3995 this summer.

VE6CN Balanced Modulator

G. O. Kincaid, VE6CN in Calgary, sends along the interesting balanced-modulator circuit he uses in his version of the Edmunds exciter. Shown in Fig. 1, it has the additional feature of providing for p.m., just in case one wants to revert to it for some reason. The oscillator circuit starts faster than the original, and it can be "pulled" by tuning, for better alignment with the filter. The filter is first aligned by removing the oscillator crystal, introducing a BC-221 signal across C₄, and using the original alignment procedure.

Then the oscillator crystal is replaced and the oscillator frequency trimmed by adjusting the trimmer in the primary of T₁.

The p. m. is obtained by tuning the secondary of T₁ until the voltage fed to the carrier-amplifier tube is 90 degrees different than that applied to the balanced modulator. For p.m., the crystal filter must be out of the circuit, of course, since the p.m. signal is obtained by combining the two sidebands (less carrier) with a carrier that has been shifted 90 degrees. Checking with a 'scope, one simply sets the trimmer in the secondary until there is minimum amplitude change on the carrier with modulation. The two circuits of T₁ "pull" a little, so the complete adjustment may require several trial runs.

—B.G.

Strays

B. C. Twinn, G3CGL, and F. B. Singleton, G3CGM, are consecutive in the *Call Book*.

—
"Television was introduced in Denmark last fall and may soon be shut down . . . only 400 sets have been sold so far." — *Chicago Daily News* via W9ZMY. Have you applied for your OZ calls yet, fellows?

—
The article in January *QST* on pi networks (page 10) mentioned an unpublished paper by Warren B. Bruene, WØITK, on the general subject of plate tank circuits and antenna coupling. We are glad to report that this paper appeared in the May, 1952, issue of *Electronics* under the title, "How to Design R.F. Coupling Circuits."

In addition to containing L-network charts and describing their applications in pi-network design, the article discusses conventional tank circuits in both the direct- and inductively-coupled forms. Design charts and equations covering various cases are given, the inductively-coupled circuit being treated in terms of Q and the coefficient of coupling. Information on cal-

culating harmonic suppression also is included.

A limited number of reprints is available, and copies may be obtained by addressing a request to the Collins Radio Company, Cedar Rapids, Iowa.

STAFF VACANCY

ARRL has a vacancy to be filled in its Communications Department staff. This post involves correspondence on and responsibility for the handling of DXCC Awards. It's also a job that takes knowledge of and background in the many phases of amateur operating. Experience in League field work, traffic, DX, organizing, also background of some operating in contests such as the DX Test, Sweepstakes and Field Day is desirable but not specifically a requirement as to how much in a given branch. Essential: age 20-30, personable, appropriate experience, accuracy, skill, typist, ability to keep records and formulate statements or reports from time to time for *QST*. Starting salary around \$3000. Preference given single man. Personnel form sent on request. Be sure to attach snapshot of yourself, indicating age, license, experience, jobs held past and present, availability. Any information will be restricted to use in connection with prospective employment.

Antenna-Mast Loading and Guying

Considerations in the Use of Pipe Masts for 10-Meter Beams

BY CHARLES KANDEL,* W2VOU

WHILE some amateur antenna masts are installed after careful calculation of the factors involved, the large majority are probably worked out using the "by-guess-and-by-gosh" principle. The author had occasion to work out the stresses and loads for a number of different heights of pipe and tubing supports for 10-meter beams, for a talk before the N. Y. Radio Club, and it was thought that the tabulated results might be of interest to other amateurs who are contemplating similar installations.

All of the designs are based on a simple pipe or tubing mast, guyed three-quarters up the mast by a set of three guy wires or cables arranged 120 degrees apart. There is no advantage in using

four guy wires instead of three, because the guys are used primarily to take up wind loads, and with a four-wire guy system there will be times when all of the load is taken by one wire. The same is true, of course, for the three-wire system.

A typical antenna mast is shown in Fig. 1, with the antenna omitted for simplicity. The antenna must, of course, be included in the calculations, because it represents the major portion of the wind load. The term "counter pull" is a mathematical convenience, the horizontal component of the force acting on the guy wire. The other forces and dimensions are obvious, and are shown to enable one to understand the tables quickly.

Table I shows the forces and stresses that exist in typical installations. Two types of 10-meter beams were included — wide-spaced 4-element beams on 20-foot booms, and close-spaced 3-element beams on 10-foot booms. Elements of $\frac{3}{4}$ -inch and $\frac{5}{8}$ -inch diameter were assumed. Calculations are based on a maximum wind force of 40 pounds per square foot (90 m.p.h.). The "combined stress" consists of two factors, the maximum bending moment (usually occurring at the point where the guy wires are tied to the mast) and the compression stress on the mast metal (caused by the vertical component of the guy-wire tension). The "combined stress" does not include any "dead" load, such as the weight of the beam, motor or mast itself, since the combined total of these is insignificant for ordinary installations, even when the dead load total adds up to a few hundred pounds. If the dead load is substantially greater, the amateur should have a structural engineer design the mast, as he should also in any case where the wind resistance of the mast is more than 10 or 15 times the resistance of the beam, since other design factors are involved.

In all cases, it is assumed that all guy wires are made up equally snug with turnbuckles, but *not too tight*. They should be adjusted seasonally with major temperature changes. Very tight guy wires may cause the mast to be pre-stressed to the point exceeding the maximum wind load. In such a case, when the full wind load is added to the existing stresses in the mast, the combined stresses will cause the mast to buckle and fail.

Table II illustrates how using an antenna with anchorages farther out from the base of the mast will result in reduced guy-wire tension. While everyone knows this intuitively, the actual order of magnitude of the reduction can be readily appreciated by a study of the table.

Anchoring the Guy Wires

The above data cover mast installations for a flat area or peaked roof with timber beams into which the lag screws would be driven after drilling

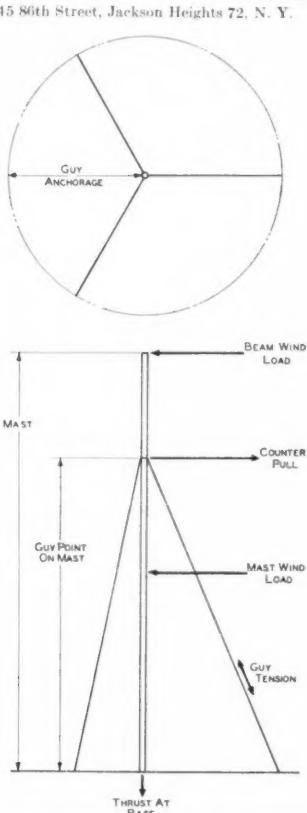


Fig. 1 — Typical mast of the type discussed in the text. For simplicity, it is drawn without the 3- or 4-element beam mounted on the top.

TABLE I
Dimensions for Masts and Guy Cables To Support 10-Meter Beams at Desired Height

<i>I</i>	<i>Type of Beam</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>	<i>4-el.</i>
<i>2</i>	<i>Boom Dimensions (inches \times feet)</i>	2 \times 20	2 \times 20	2 \times 20	2 \times 20	2 \times 20	2 \times 20	2 \times 20	2 \times 20	1 $\frac{1}{2}$ \times 10	1 $\frac{1}{2}$ \times 10
<i>3</i>	<i>Beam Wind Load¹ (pounds)</i>	200	200	200	200	200	200	200	200	200	200
<i>4</i>	<i>Mast Wind Load¹ (pounds)</i>	204	141	140	89	93	53	56	21	12	15
<i>5</i>	<i>2-ST Tubing Mast^{2, 3} 3$\frac{1}{2}$-in. Wall (in. diam. \times feet long)</i>			3 \times 20	2 $\frac{1}{2}$ \times 16		2 \times 12	1 $\frac{1}{2}$ \times 6	1 $\frac{1}{2}$ \times 9		1 \times 5
<i>6</i>	<i>Steel Pipe Mast² standard weight (nominal diam. \times feet long)</i>	3 \times 25	2 $\frac{1}{2}$ \times 21		2 \times 16	1 $\frac{1}{2}$ \times 12				1 \times 5	1 \times 9
<i>7</i>	<i>Guy Point on Mast⁴ (feet above base)</i>	18 $\frac{3}{4}$	15 $\frac{3}{4}$	15	12	12	9	9	4 $\frac{1}{2}$	6 $\frac{3}{4}$	3 $\frac{3}{4}$
<i>8</i>	<i>Guy Anchorage⁴ (feet from base)</i>	7	5 $\frac{1}{2}$, 10	5 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
<i>9</i>	<i>Thrust at Base (pounds)</i>	1125	976	930	864	876	801	810	740	386	740
<i>10</i>	<i>Tension on Each Guy (pounds)</i>	1150	1041	998	911	935	854	860	730	386	730
<i>11</i>	<i>Diameter of Guy Cable⁵ (inches)</i>	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
<i>12</i>	<i>Lag-screw Size for Guy Anchor (inches)</i>	$\frac{1}{2} \times 6$	$\frac{1}{2} \times 5$	$\frac{1}{2} \times 5$	$\frac{1}{2} \times 5$	$\frac{1}{2} \times 5$	$\frac{1}{2} \times 4\frac{1}{2}$				
<i>13</i>	<i>Combined Stress on Mast Material (lb. per sq. in.)</i>	10,300	13,400	20,200	18,900	20,200	23,800	24,000	22,500	22,000	24,300
										22,000	24,500
										24,000	24,000

¹ Based on 10 lb. per sq. ft. \times 0.7 for round tubing, thus 2-inch diam. tubing has a wind load of $40 \times 0.7 \times 2^2 \cdot 12 = 4.7$ lb. per linear foot. Double the wind load for square tubing. Thus 2-inch square tubing has a wind load of $40 \times 1/12$ diagonal of tube = 9.4 lb. per linear foot.

² Mast length not to be increased even with a beam of lower wind resistance, because the permissible slenderness ratio would be exceeded.

³ For wall thickness less than $\frac{1}{8}$ inch, use beam having wind load proportionately less than shown on line 3.

⁴ These dimensions may not be reduced without noting their effect upon items in lines 9, 10, 11, 12 and 13.

⁵ Dimensions are for common steel, galvanized. Smaller diameter may be used for high-strength cable.

TABLE II

Examples of Reduced Guy Tension and Reduced Thrust at Base of Mast Resulting from Use of Beams with Lower Wind Load and/or Use of Wider Guy Anchorage Base

1	Type of Beam	4-el.	3-el.	4-el.	4-el.	3-el.	3-el.	3-el.	3-el.	3-el.	3-el.
2	Boom Dimensions (inches \times feet)	2 \times 20	2 \times 10	2 \times 20	2 \times 20	2 \times 10	1 $\frac{1}{2}$ \times 10	2 \times 10	1 $\frac{1}{2}$ \times 10	1 $\frac{1}{2}$ \times 10	1 $\frac{1}{2}$ \times 10
3	Diam. Elements (inches)	$\frac{5}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
4	Beam Wind Load ¹ (pounds)	200	150	200	200	150	100	150	100	100	100
5	Guy Anchorage ² (feet from base)	4 $\frac{1}{2}$	4 $\frac{1}{2}$	6	8	6	4 $\frac{1}{2}$	8	6	8	12
6	Counter Pull	329	264	329	329	264	195	264	195	195	195
7	Thrust at Base (pounds)	876	672	660	492	528	520	396	390	293	195
8	Tension on Each Guy (pounds)	935	743	737	590	590	559	475	435	351	276
9	Reduced Tension, Each Guy Cable (%)	—	20	20	37	37	40	50	52	62	72
10	Combined Stress on Mast Materials (lb. per sq. in.)	20,200	19,300	18,900	18,900	19,300	15,600	19,300	15,600	15,600	15,600

¹ Mast for all beams: 2 $\frac{1}{2}$ -inch diam. 24ST tube 16 feet long, $\frac{1}{8}$ -inch wall, or standard-weight 2-inch steel pipe 16 feet long.

² Guys attached to mast 12 feet above base.

an undersized pilot hole and filling it with roofing compound. No lag screw should be placed less than 27 inches from the end of a timber beam when the guy pull is 500 pounds, or 36 inches if the pull is over 500 and less than 1000 pounds. This will insure that the lag screw is in the center of a square large enough to take the strain.

For a mast that is guyed from points on the ground, each guy wire should be anchored to a "deadman" — a galvanized cast steel plate with ribs (available commercially in various sizes) to which a long galvanized eyebolt is attached after the plate has been set in the ground. The recommended procedure for installing a "deadman" is to dig a hole with a vertical side toward the mast and a sloping (45-degree) side away from the mast. The eyebolt is then driven into the undisturbed ground from the mast side at a 45-degree angle down to the bottom of the hole, where the plate can be slid down the sloping side

of the hole and into the ground until the eyebolt can be installed and secured with a nut. This puts the eyebolt in undisturbed ground with the plane of the plate at right angles to the line of the bolt. The excavated material should be replaced in batches, and each batch should be tamped firmly in place.

Table III gives the recommended sizes of bolts and plates to be used with various guy-wire pulls. For heavier loading than shown, merely increase the area of the plate and the diameter of the bolt, the length of the bolt and the depth of excavation need not exceed the maximum figures shown.

The table applies to sandy soil with good drainage. Soil consisting of firm clay will stand about 50 per cent more pull, while hardpan (a soil which can be broken up only by the use of a pick or crowbar) will carry 100 per cent more than sandy soil. However, soil that is wet and soggy to a considerable depth most of the time cannot be depended upon to take the full pull, and due allowance must be made for this condition by using a larger plate and a longer eyebolt.

The "deadmen" commercially available and widely used by power companies are cast steel (galvanized) about $\frac{1}{4}$ inch thick, with ribbed stiffeners cast into them. If ordinary steel plate is used, it should be somewhat thicker and prepared conveniently

(Continued on page 126)

TABLE III
Guy Anchor Data

Guy Pull (pounds)	Plate Size ¹ (inches)	Bolt Diam. (inches)	Bolt Length ¹ (inches)	Depth to Plate Hole (inches)
500	6 \times 6	$\frac{9}{16}$	36	25
800	6 \times 6	$\frac{5}{8}$	36	25
1100	6 \times 7	$\frac{3}{4}$	42	29
1500	6 \times 7	$\frac{7}{8}$	48	33
2300	6 \times 8	1	60	42
3500	6 \times 9	$1 \frac{1}{4}$	72 ²	52

¹ Minimum.

² Maximum.

Constructing Safety Interlocks from Standard Parts

BY RONALD L. IVES *

ALTHOUGH interlock switches are recommended on all radio equipment so that when the cabinet door is opened all high-voltage circuits are de-energized, such switches are not readily available, and many of the small commercial models are not in accord with local electrical codes.

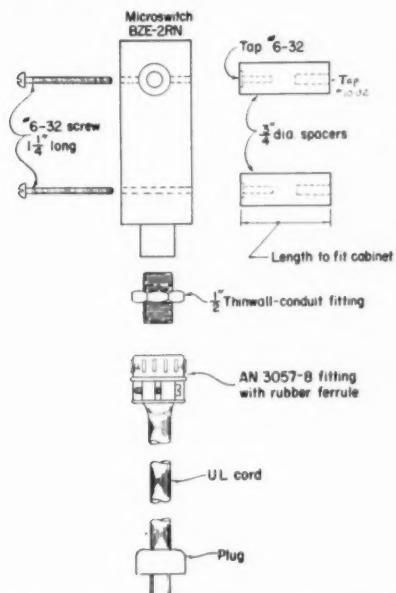


Fig. 1 — Microswitch mounting for service as rack-cabinet interlock.

A neat and relatively inexpensive interlock switch that is quite safe and which will pass most electrical inspectors can be constructed easily from a Microswitch and a few standard fittings. Constructional details are sketched in Fig. 1. Because all electrical parts are standard UL or AN fittings, and all fit together without alterations, appearance is quite workmanlike and neat. Mountings for most rack cabinets are quite simple, requiring only straightforward machine work, with no highly-critical dimensions.

Length of spacers, for Par-Metal rack cabinets of the ER-223 series, should be about 1 1/4 inches. The switch is held in place by two 10-32 rack screws through the side of the cabinet. Alternative mountings include a right-angle bracket,

*5415 Main St., Williamsville 21, N. Y.

screwed to the rear frame of the cabinet, and a bracket to support the switch from the rear of a convenient chassis. Best location for the switch is so that the actuating button is operated by the door catch housing when the cabinet door is latched. This eliminates any tendency of the switch to warp the cabinet door.

A satisfactory electrical location for a safety interlock switch is between the main fuse and the main system switch, as in Fig. 2A. If extra safety is desired, the interlock can be used in conjunction with an electrically self-holding relay, as shown in Fig. 2B. This prevents accidental or intentional turning on of the power by manual operation of the interlock. Once the circuit is broken by S_2 , it is necessary not only to close the interlock, but also to close the "start" or "on" push-button switch before the system is electrically live. Since this requires the use of both hands when the cabinet is open, the chance of shocks is at a minimum.

Whatever circuit is used, some sort of safety interlock should be incorporated in every rack cabinet. Safety measures are much cheaper than funerals!

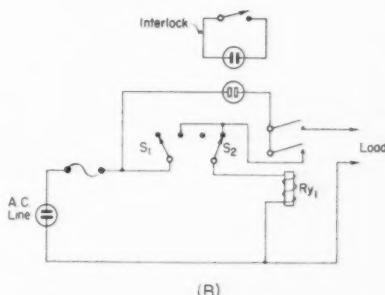
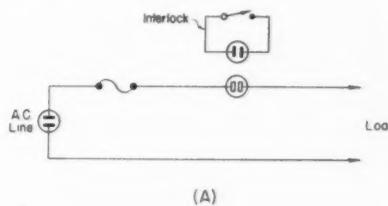
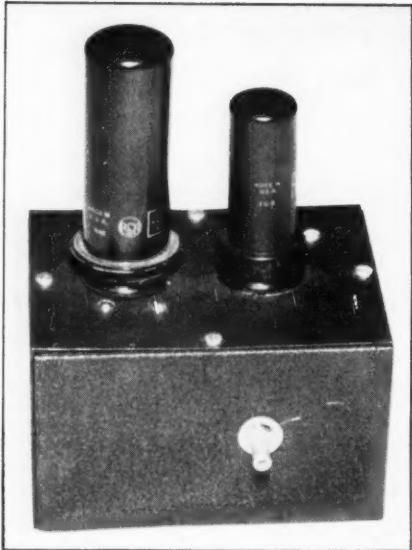


Fig. 2 — A — Simple interlock circuit. The switch is simply plugged in series with the a.c. line. B — Circuit using interlock in conjunction with a locking relay. The switches are push-button type. S_1 (on) is normally open, while S_2 (off) is normally closed.



• As W4JJX points out here, a VFO doesn't have to be so elaborate if you are interested in 75-meter operation only. The simple unit described should be entirely adequate for this purpose.



This small VFO unit designed primarily for 75-meter 'phone work requires little chassis space. The tuning shaft is extended to the dial on the transmitter panel.



Simple VFO Construction for the 75-Meter 'Phone Band

BY CHARLES McDOWELL,* W4JJX

I AM not disputing the fact that the more complicated and elaborate VFO units which appear from time to time in *QST* have their proper place. Too much care cannot be used in the electrical design and construction of the oscillator when its multiples are to be used for operating in the higher-frequency bands. However, many of the refinements featured in such units are unnecessary and disproportionately expensive for the ham who asks only for something with which he can shift frequency in the 75-meter 'phone band. In such a case, simplicity and physical size become more important factors.

In searching about for a simple but reliable circuit, the one shown for the "Coffee-Can" ¹ VFO in a previous article appealed strongly to this rock-bound character for several reasons. The circuit, shown in Fig. 1, is simple. It requires relatively few components so that the unit can be made small enough physically to fit, in many instances, on the chassis of an existing rig. A reasonable amount of isolation is provided by the buffer stage. Also, in working 'phone in a crowded band, frequency drift is one of the most important considerations and the Clapp circuit used in the "Coffee Can" excels most others in this respect.

Only two essential changes were made in the

original circuit. A 6AG7 was substituted for the 6V6 in the oscillator, more or less as a matter of personal preference, and the tuning range was restricted to cover only slightly more than the 75-meter 'phone band for better bandspread. However, the original full-band coverage can be easily retained, if desired, simply by using a 75- μ fd. tuning condenser.

Construction

The parts are assembled in a standard 3 × 4 × 5-inch box. The tubes are mounted externally on top of the box to keep most of the tube heat away from the tuned-circuit components, minimizing drift. All of the components, except the three tuning condensers, C_3 , C_4 , and C_5 , and the coil, L_1 , are mounted on the underside of the top cover. Thus, most of the wiring and soldering can be done before assembling the box.

The coil is fastened to the side of the box. The tuning condenser, C_4 , is mounted on the front. The paint is scraped away from around the condenser shaft mounting hole to provide a good ground contact for the condenser rotor. The negative-temp trimmer, C_5 , and the zero-temp pad, C_3 , are mounted directly across the bottom end of the tuning condenser. The bottom end of the coil can be connected to the tuning-condenser stator before the top and bottom plates are attached. The connection from the other end

* 2021 Lee Terrace S.W., Birmingham 11, Ala.

¹ Hayward, "The Coffee-Can VFO," *QST*, Aug., 1949, p. 22.

Fig. 1 — Simple VFO circuit.

C₁, C₂ — 0.001-mfd, silvered mica.
 C₃ — 150- μ fd, zero-temp. ceramic (Centralab TCZ-150).

C₄ — 50- μ fd, variable for phone band only (Bud LC-1644); 75- μ fd, for entire 3.5-Mc. band (Bud LC-1645).

C₅ — 45- μ fd, neg-temp trimmer (Centralab 822-BN).

C₆, C₇, C₁₀ — 100- μ fd, mica.

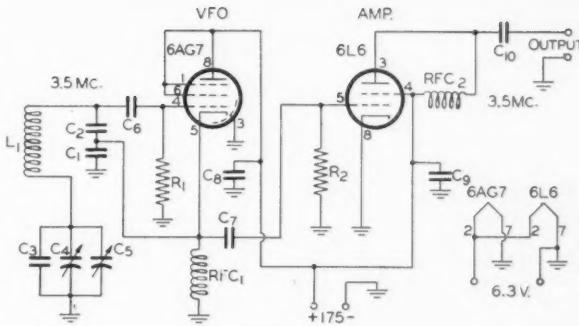
C₈, C₉ — 0.01- μ fd, disk ceramic.

R₁ — 0.1 megohm, $\frac{1}{2}$ watt.

R₂ — 47,000 ohms, $\frac{1}{2}$ watt.

L₁ — Approx. 12 μ H — 23 turns
 No. 16 enam., 1 $\frac{1}{2}$ -inches
 diam., close-wound.

RFC₁, RFC₂ — 2.5-mh. r.f. choke.



of the coil to the junction of C₂ and C₆ is made by leaving the coil lead long enough to reach a 3-terminal lug strip on which C₁ and C₂ are mounted, and soldering the connection while the plate is held about a half inch from its regular position. This procedure was necessary because the large and not so deft hands of the author are not well suited to working in such small quarters. The power leads and the output lead are brought out through grommeted holes in the side or bottom to suit the transmitter layout.

I use a National type AM vernier dial which gives an easily handled tuning rate.

Adjustment

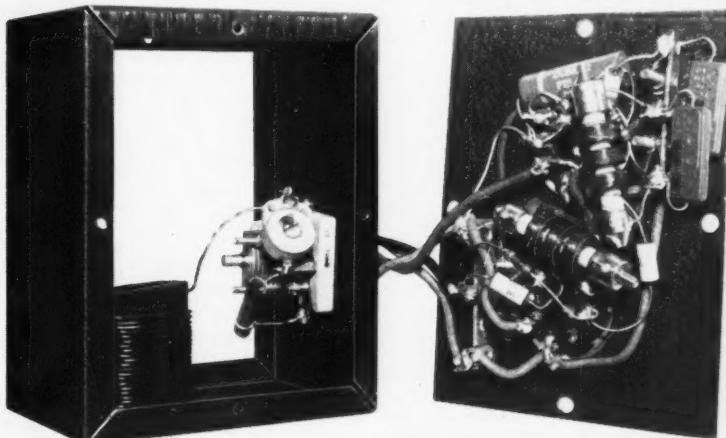
The VFO should not be mounted in the transmitter until the frequency range is checked with the bottom plate in place. Shielding affects the inductance of the coil, and if the frequency is set with the bottom plate removed, the frequency will not be the same with the plate in place. It is necessary to set C₅, attach the bottom plate, and

then check the frequency limits. If the range is not as desired, remove the plate, readjust C₅, replace the plate and check again until the right range is obtained. An alternative, of course, would be to mount the trimmer in such a position that the trimmer adjusting screw can be reached through a hole in the side of the box.

Performance

This VFO works well at a plate voltage of 100 or less and gives a healthy output at 175 volts. I use it to drive a 2E26 buffer amplifier, the VFO operating from a tap on a voltage divider across the 400-volt supply for the 2E26. Reports from many stations worked show that drift is negligible. Despite the fact that c.w. performance was a secondary consideration, T9 reports are often received when keying the 2E26 in the cathode circuit. Although I have not had occasion to try it, since I do not feel the need for rapid break-in, it seems probable that the oscillator itself could be keyed with reasonably good characteristics.

Most of the components for the simple VFO are assembled on the top cover plate. Only the tuned-circuit components are fastened to the box walls.



A 200-Watter for 160

Compact Construction for Restricted Space

BY ROBERT M. RESCONSIN,* WITRF

A FEW MONTHS ago I decided to try the 160-meter band, just to see what it was like. My medium-power 10-meter transmitter was too much of a problem to get down to frequencies that low, so I threw together a haywire-style rig for the trial. After only a few nights of operating, I knew I was there to stay and immediately began to lay plans for an outfit more in keeping with the facts. When the ham shack has to be in the dining room, haywire and unnecessary bulk lives on borrowed time if the XYL has anything to say about it — and she usually does! Aside from the considerations of compactness and appearance, I wanted to run the legal nighttime limit on power, have VFO control and utilize the power supply and modulator from the 10-meter rig. Last, but certainly not least, the unit had to be well shielded for TVI because the activity on 160 is usually at its best during TV hours. All of this, of course, called for much planning and checking. But, in the end, the results were all that could be desired in a transmitter for 160 meters.

Circuit

The circuit I finally decided upon is shown in Fig. 1. A 6AG7 is used in the series-tuned VFO which works on 160. The oscillator plate circuit, which is untuned, is capacity coupled to another 6AG7 in the buffer stage. Cathode bias is supplied to the buffer stage by R_3 . The buffer screen voltage is taken from the regulated source that supplies the VFO section. The buffer operates straight through and is coupled to the final-amplifier grid by C_{14} . An 813 was chosen because of its low drive requirements and its adaptability to a wide range of plate voltages — you can run an input of 200 watts with a plate voltage as low as 1200. The stage is neutralized by means of a simple homemade condenser, C_{17} . It will be noticed in Fig. 1 that the conventional neutralizing connection, shown in dotted lines, was not used in this instance. Apparently, stray wiring capacitances are such that the circuit is "over-

neutralized," requiring the introduction of positive, instead of negative, feed-back for neutralization. Therefore, the neutralizing capacitance is directly from grid to plate. It should be borne in mind, however, that the use of different components, or a slightly different layout, may require the conventional connection shown in dotted lines, rather than the one used.

Fixed bias is supplied to the final amplifier by a 50-ma. selenium rectifier and a small filament transformer, T_2 , working in reverse from the 6.3-volt filament supply. A VR-150 is used to stabilize the biasing voltage. Screen voltage is supplied from the high-voltage source through R_8 and R_9 to provide a simple means of modulating both plate and screen.

Although the output circuit is designed primarily for 160 meters, reasonable efficiency is possible in doubling to 80 meters in the final when using

the 3.5-Mc. tank coil specified in Fig. 1.

Construction

The transmitter is constructed entirely on a standard 10 × 17-inch chassis with a 10½-inch panel. The VFO portion is built on the left-hand side of the chassis and will be described first. The 6AG7 socket is inverted so that the tube extends below the chassis. This method allows all of the wiring on the socket to be enclosed within the shield. C_3 , C_4 , C_5 and the grid resistor, R_1 , are all soldered directly to the socket, and the filament by-pass condensers, C_{23} and C_{24} , as well as the screen by-pass condenser, C_7 , are soldered directly to ground from their respective pins. Shielded power wires are brought into the compartment through rubber grommets. The r.f. plate lead to the coupling condenser, C_8 , is

* In this article, WITRF describes his 200-watt 160-meter rig. The simple 3-stage circuit includes a built-in VFO and ends up with an 813. While designed primarily for 160, it also perks on 80.

*215 Main St., Rocky Hill, Conn.

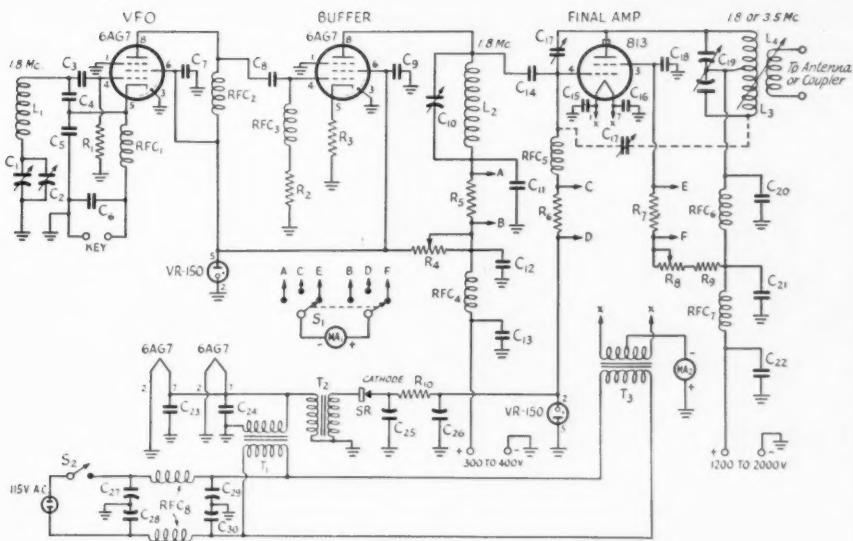


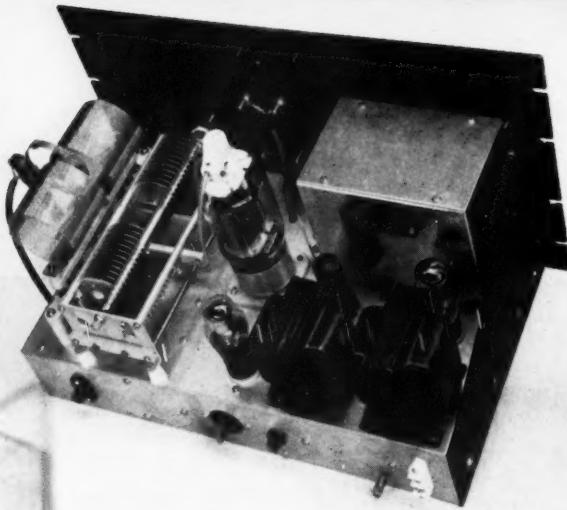
Fig. 1 — Circuit diagram of the 200-watt 160-meter transmitter.

- C₁ — 100- μ fd. variable (Millen 22100).
 C₂ — 50- μ fd. variable (Millen 19050).
 C₃, C₈, C₁₄ — 100- μ fd. mica.
 C₄, C₉ — 680- μ fd. silvered mica.
 C₆, C₇, C₉, C₁₁, C₁₂, C₁₃, C₁₅, C₁₆, C₂₂, C₂₄ — 0.01- μ fd. disk ceramic.
 C₁₀ — 140- μ fd. variable (Millen 19140).
 C₁₇ — Neutralizing capacitance; see text.
 C₁₈, C₂₀, C₂₁, C₂₂ — 0.001- μ fd. 5000-volt mica.
 C₁₉ — Dual-section variable, 200- μ fd.-per-section (National TMC-200-D).
 C₂₅, C₂₆ — 8- μ fd. 250-volt electrolytic.
 C₂₇, C₂₈, C₂₉, C₃₀ — 0.1- μ fd. molded.
 R₁, R₂ — 22,000 ohms, $\frac{1}{2}$ watt.
 R₃ — 220 ohms, 1 watt.
 R₄ — 10,000 ohms, 10 watts, adjustable.
 R₅, R₇ — 100 ohms, 2 watts.
 R₈ — 25,000 ohms, 50 watts, adjustable.
 R₉ — 25,000 ohms, 50 watts.
 R₁₀ — 500 ohms, 2 watts.
 L₁ — 100 μ h. — 68 turns No. 30 s.s.c. close-wound on 1-inch form.
 L₂ — 70 μ h. — 96 turns No. 24, 1-inch diam., 3 inches long (B & W 3016 Miniductor).
 L₃ — 1.8 Mc. — 90 μ h. — 56 turns No. 16, 3-inch diam., 6 inches long over-all, $\frac{3}{4}$ -inch space at center for L₄ (B & W 160-TVH or TVL with mounting for plug-in link).
 3.5 Mc. — 40 μ h. — 38 turns No. 14, 3-inch diam., 6 inches long over-all, $\frac{3}{4}$ -inch space at center for L₄ (B & W 80 TVH or TVL).
 L₄ — 5-turn variable link (B & W 3555).
 M_{A1} — D.c. milliammeter, 50-ma. scale.
 M_{A2} — D.c. milliammeter, 500-ma. scale.
 RFC₁, RFC₂, RFC₃, RFC₄ — 2.5-mh. r.f. choke (National R-100-S).
 RFC₅, RFC₇ — 7- μ h. r.f. choke (Ohmite Z-50).
 RFC₆ — 4-mh. r.f. choke (National R-152).
 RFC₈ — Line-filter choke (Ohmite Z-21).
 S₁ — Single-wafer double-pole 3-position ceramic rotary.
 S₂ — S.p.s.t. toggle.
 SR — 50-ma. selenium rectifier.
 T₁ — 6.3-volt 3-amp. filament transformer (Stancor P-5014 or equiv.).
 T₂ — 6.3-volt 1.2-amp. filament transformer (Stancor P-6134 or equiv.).
 T₃ — 10-volt 5-amp. filament transformer (Stancor P-6139 or equiv.).

made of a short piece of RG/59-U coaxial cable and this also is brought up through the chassis along with the power leads. L₁, the VFO coil, is close-wound on a 1-inch Millen form and is mounted on a half-inch cone insulator. The ends of the winding are soldered directly to their connections so that they are held quite rigid. Two half-inch spacers are used to hold the VFO tuning condenser, C₂, above the chassis so as to line the shaft up with the drive mechanism of the National SCN dial. The oscillator padder, C₁, and its mounting bracket are bolted firmly to the chassis. A 3 × 4 × 5-inch aluminum utility box is used to cover the VFO circuit. A small opening cut in the front cover allows the tuning dial to turn freely. After all of the leads are brought through to the underside of the chassis we go on to the buffer stage.

The oscillator plate choke, RFC₂, and the buffer grid choke, RFC₃, are mounted vertically. The choke terminals are used as tie points for the coupling condenser, C₈, and the buffer grid resistor, R₂. The buffer tuning condenser, C₁₀, is mounted directly in front of the tube socket on the vertical bracket supplied with the condenser. A B & W 3016 Miniductor, just as it comes in the box, has just about the right inductance for L₂.

The 813 socket is mounted directly on the chassis to the right of the buffer-tube socket, with the coupling condenser, C₁₄, placed so that the leads are as short as possible. RFC₅, the 813 grid choke, is in front of the tube socket, near the grid-meter shunt. The meter shunting resistors for the buffer plate and the 813 grid circuits are fastened to a pair of two-terminal lug strips. The 813 screen-current shunt is mounted on two small



Top view of the 160-meter chassis removed from the cabinet. On the rear edge of the chassis are the two filament transformers and the VR tube for the bias supply. T_2 is underneath. In front of the transformers are the 6AG7 buffer tube, the VR-150 for the VFO and the aluminum box shielding the oscillator section. To the left of the 813 are the final tank condenser and the swinging-link assembly. Along the rear of the chassis are the high-voltage connector, the 115-volt input connector, the grounding post and the exciter low-voltage connector.

cone insulators and is connected with high-voltage insulated wire, since the screen voltage rises to the supply value when the tube is not being driven. All external power leads have v.h.f. filters. The components are placed in the enclosure formed by the aluminum barrier shield running the length of the chassis.

The neutralizing "condenser," C_{17} , consists of a strip of aluminum about a half inch wide and 2 or 3 inches long, bent at right angles and mounted on a feed-through insulator near the socket grid terminal. The feed-through is connected to the grid terminal and neutralizing is adjusted by altering the length of the strip or by bending it closer to, or farther from, the tube.

The output tank condenser, C_{19} , is mounted above the chassis on half-inch cone insulators. The shaft is connected to the tuning dial through a ceramic-insulated shaft coupling. The jack bar for L_3 is supported on National GS-1 pillar insulators and mounted alongside the tank condenser. Another insulated shaft coupling is used to extend the shaft of the swinging link to the panel. A length of coaxial cable is run from the link assembly to the antenna terminal along the left drop of the chassis.

The shielding barrier is spaced 3 inches from the rear. This enclosure contains all of the a.c.

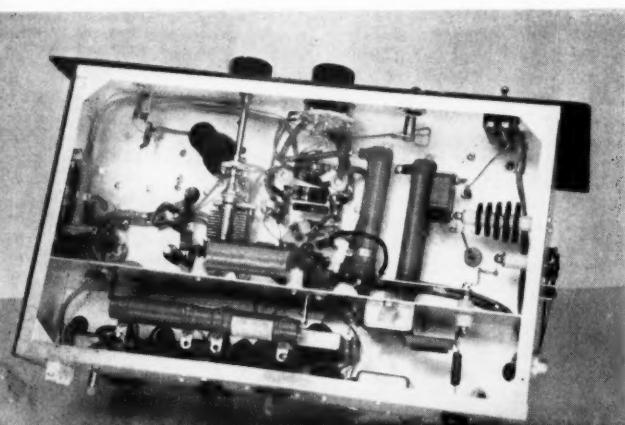
wiring, the line chokes and the bias supply. The high voltage to the final is routed through a feed-through in the shield. L_2 is cemented between two ceramic cones on the other side of the barrier.

Adjustment

After turning on the low-voltage supply, the slider on R_4 should be adjusted to the point where the VR tube just stays ignited with the key closed. At resonance, the buffer plate current should be about 22 ma. and screen current approximately 8 ma. This should produce an 813 grid current of 18 or 20 ma. When the key is opened, the buffer plate current should drop to about 12 ma. while the screen current is reduced almost to zero. If there is any variation in buffer plate current as the tank circuit is turned through its range with the key open, a check should be made for parasitic oscillation, as discussed in the ARRL *Handbook*.

In tuning up the final amplifier, the screen resistor, R_3 , should be adjusted to leave about 20,000 ohms in the circuit and quarter or half maximum plate voltage applied. A dummy load should be connected and the output tank tuned to resonance. As the load is adjusted to take current, the plate and screen voltages can be

(Continued on page 126)



Bottom view of the 160-meter transmitter. R_4 is to the left. The inverted 6AG7 oscillator tube is just to the left of the buffer tuning-condenser shaft. In front of the 813 socket are the meter-shunting resistors and the meter switch. R_8 and R_9 are to the right of the 813 socket. The final plate choke is mounted on the right drop of the chassis. All power wiring is done with shielded wire to suppress v.h.f. harmonics.

Arkansas-Tennessee Tornadoes

Amateurs in "Tornado Alley" Provide Emergency Communication as Twisters Destroy Power and Wire Lines

BY GEORGE HART,* W1NJM

TORNADOES are not exactly rarities in the Southern and Midwestern states, but the series of twisters that leapfrogged over Arkansas and western Tennessee, to say nothing of other storms in the surrounding states of Mississippi, Alabama and Missouri, in late March set a record of destructiveness and fury that is unsurpassed in the long tornado history of this area. One cannot be sure whether the various funnels which became apparent on and after March 21st were separate storms in themselves or different visitations of the same over-all clash of warm- and cold-air "fronts" which, combined with other atmospheric conditions, were conducive to the formation of whirling air funnels of terrific speed and strength which cut swaths of destruction through Arkansas and Tennessee.

We amateurs, although not too well versed on the cause of the tornadoes, are certainly aware of their effects in terms of broken communication and power lines coupled with what this means to our emergency establishment. And but for the quick activation of amateur stations in most of the affected areas, the suffering felt by the populace would certainly have been greater and spread over a longer period of time than it was. This is the story of that amateur participation, compiled from the thick sheaf of reports from Emergency Coöordinators and participating amateurs which has been received since the incident.

Arkansas

The tornadoes in Arkansas started in the southwestern part of the state with a funnel at the little town of Dierks. This particular twister progressed northeastward, as did they all, and then disappeared. Very shortly afterward, however, additional funnels formed at England, at

* National Emergency Coöordinator, ARRL.

The set-up at Judsonia, W5DVI^{1/5}. Looking out the window, one can see the roof blown off the parsonage next door to the church in which the station was established. The rig was a Collins exciter driving a pair of 4-125As to 500 watts input — the amount of power needed to get through the QRN. James Girdley, a prospective ham, holds the mike while W5DVI and W5OCN prepare messages in proper form for transmission.

Georgetown and at Searcy, each progressing northeastward and finally disappearing after spreading its quota of destruction. Later that night tornadoes struck points in Western Tennessee.

The destruction at Dierks, although great, was only a harbinger of disaster to come upstate. Shortly after the twister struck at 1515 and moved on in the general direction of Little Rock, W5AQF offered to set up a station at Dierks but was told there was no real need, since the town still had communication. It was not until Saturday afternoon, the day after the tornado, that W5AQF was requested to set up a station, which was accomplished on Sunday morning with the aid of W5EGY. Set up at Red Cross Headquarters, the station handled traffic for Western Union and the Red Cross. W5JTR was the Shreveport contact, from which point WU traffic normally comes into Dierks, and outgoing traffic was handled through W5ICS at Fort Smith. Others who assisted included W5s APW, BJH, EA, FPD, JIC, KKM and W9UID. Operation was buttoned up at 1730. Nine messages were received and 21 sent on behalf of the Red Cross.

The biggest and most destructive of the Arkansas tornadoes hit Searcy at 1730 on Friday, March 21st, and passed along to lay waste the small towns of Judsonia and Bald Knob. Six mobiles from Little Rock drove toward the area and for a time maintained contact with Little Rock, but it was not reliable due to skip conditions. W5STV put 100 watts on the air from Searcy and handled 8 or 10 messages, but at daylight it was impossible to reach Little Rock. A group of five amateurs headed by W5DVI left Little Rock about 2230 Friday night with a 1500-watt a.c. gasoline-driven generator and enough gear to establish a 100-watt station. This station was set up in the Methodist Church, one of the few usable remaining buildings in Judsonia,



in which there was no heat, communications or power. Rain and lightning heralded the arrival of this group, and unheard-of QRN marked the initial operation of W5DVI/5.

Within 45 minutes of the time of arrival, W5DVI/5 was on the air, this in spite of transmitter difficulties. Contact was established with W5BCZ, and this contact was maintained throughout the night, although relays were necessary at times due to skip. Red Cross and town officials assisted in setting up a routine and priority system for outgoing traffic. Persons wishing to send messages had to file them at a desk set up for that purpose, although medical and Red Cross personnel filed theirs in the radio room for priority handling. The traffic was brought to the radio room six or eight at a time, and the station never got more than 30 minutes behind in its traffic handling.

But the boys had their troubles. In addition to transmitter troubles, there was QRM from a.c. generators (not their own, which was effectively silenced) and ear-splitting QRN. Low power would have been useless, and even the 100 watts they were using was hardly sufficient.

At 1700 the next day three relief operators arrived from Little Rock with new transmitting equipment, and at that time the station was moved to a higher and drier location, since there was a half inch of water on the floor of the original location. Actually, W5DVI/5 was off the air less than ten minutes in changing locations. The only means of communication, this station handled traffic for Red Cross, Western Union, U. S. Post Office, National Guard, Salvation Army, Weather Bureau and the Governor. In the first 24 hours of operation, traffic was sent to the loudest station heard, to be filed with Western Union at that point. After that, amateur channels were used for welfare traffic, both incoming and outgoing, although in many cases it was not possible to get information in answer to incoming inquiries. W5PHP in Searcy was one of the reliable contacts. W5MRD/M and W5BDR/M represented Bald Knob until W5KBH was set up.

On Sunday morning (Mar. 23rd) W5DVI's half-kilowatt rig was brought to Judsonia, and this transmitter was used for communication with the outside until Wednesday at 1900, by which time a temporary switchboard had been installed. The traffic total handled by W5DVI/5 was 422, 277 of which were outgoing. Dr. George Bean, W5DVI, and the group which assisted him have been publicly praised for their services. The people of Judsonia, to say nothing of the various agencies served, will not soon forget that these amateurs supplied the only communication out of and into Judsonia for several days.

The little adjoining town of Bald Knob was also hard hit on Friday. W5RWJ of Jonesboro, upon hearing of the disaster and learning of the need for communications out of Bald Knob, transported his station the some 90 miles to Bald Knob, with the assistance of W5MSH. W5RWJ/5 was on the air from the City Hall from 1800 Saturday until 2000 Sunday; they were the only

means of communication until Sunday, when wire and telephone service were again available. Some 122 messages were handled for the National Guard and Red Cross on 3885 kc. On Sunday evening W5KBH and W5OCX arrived to relieve W5RWJ and his crew. They operated W5KBH/5 until there was no further need for their services.

One of the most outstanding stations in the Arkansas group was W5PHP of Searcy. This station was the first on the air after the tornado side-swiped Searcy, doing comparatively little damage, and then roared into Judsonia and Bald Knob, and W5PHP was designated by the Red Cross as its collecting point for welfare traffic. He operated for three days continuously, had relief for four hours and was back on again for another 24-hour shift. W5PHP gained the respect of all who worked with him by his persistence and efficiency under extremely trying conditions.

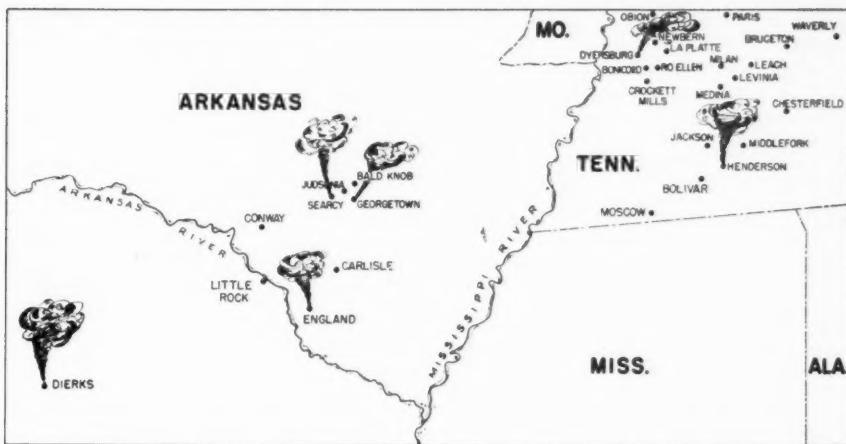
W5QIP, EC for Conway, assisted by W5s STU, ARH, TIC and TID, set up a BC654 station in Searcy about 2245 Friday (Mar. 21st) and another in Judsonia shortly after midnight. Due to the heavy atmospherics which always accompany tornadoes, these low-power units were not too effective, and the Judsonia station was dismantled when W5DVI and his crew arrived on the scene.

Tennessee

The fact that the terrific tornadoes which struck Dyersburg and Henderson, Tenn., followed by only a few hours those which twisted across Arkansas in that same direction lends credence to the probability that they were part of the same disturbance, which later also alerted parts of Kentucky and West Virginia and came close to creating panic in some places. But by the time the disturbance which begets tornado conditions got this far north the winds had died down and all that was left was drenching rain.

In their dying throes, the tornadoes that hit Arkansas in the afternoon lashed out in renewed fury that evening at western Tennessee. The first town hit was Moscow, and then Henderson was all but levelled. Further north Dyersburg felt the force of another twister, killing scores of people, injuring hundreds and wreaking property destruction into the millions of dollars.

In Henderson, RM W4AGC contacted W4EDC immediately after the blow, and the latter went to Jackson to obtain an emergency power supply, which was not available locally. When he returned, it was found that the Jackson Radio Club was setting up facilities in Henderson. Failing to establish contact between W4HXC/M and W4HPO in Jackson, the group put W4EDC/4 on the air about 0545 Saturday (Mar. 22nd). This station operated with fair success until a second emergency generator was put on the air at 1715 Saturday, using the call W4AGC, who immediately called the Tennessee Net on 3635 kc. Within 15 minutes, 25 stations had reported in and the traffic began to flow. W4AGC alone handled over 300 messages through the facilities of the Tennessee c.w. and 'phone nets, the Fifth



and Ninth Regional Nets of NTS, and ARRL Trunk Line J. The session lasted until 0130 March 23rd (Sunday), then was resumed again at 0900 and operated until 2300. W4JU and W4BAQ maintained liaison with Arkansas 'phone and c.w. nets.

W4AKJ, EC at Crockett Mills, reported into the Tennessee Phone Net at 0850 Saturday morning (Mar. 22nd), having heard of the emergency at Dyersburg. Later, having collected some traffic for Dyersburg, he visited that town to deliver it, and visited Western Union, telephone company and the Red Cross to see if any assistance was needed. The need did not seem to be particularly urgent; nevertheless, he contacted W4OFX to see what facilities were available, and after taking inventory they got W4STX to come down from Newbern with a small rig. With low power and transmitter difficulties, however, contact was not satisfactory and most of the traffic was carried from Dyersburg to be originated at W4AKJ, handled mostly through the Tennessee c.w. net on 3635 kc.

Miscellaneous

The emergency nets operating in Arkansas and Tennessee received considerable assistance from other nets outside these two states in facilitating their long haul traffic and conducting traffic relays necessitated by skip conditions, which were especially prevalent on 75 and 80 meters, the two bands most used in the emergency. The Transcontinental Relay Net (TCRN) on 7042 kc. remained in session to assist with traffic to and from the storm area, and a new net was formed on 7090 kc. by W9GBJ, WSDLZ and W5TOE, the latter in Little Rock. Stations in this net would comb the band for traffic and bring it or the stations having it to the 7090 frequency for clearance. The National Calling and Emergency Frequency, 7100, was especially monitored.

WØEBE of Springfield, Mo., cleared a considerable amount of traffic with the Arkansas storm area on 75 and 80, while Trunk Line J

(Ninth Regional Net) and the River Forecast Net under W9TT handled much traffic with the tornado-stricken areas in Tennessee by conducting special sessions and maintaining contact with W4AGC, with W9LZI and W4MWX turning in especially noteworthy performances. Approximately 100 messages were handled. The NTS Fifth Regional Net held a special session but was not called upon to assist in traffic relay.

Each amateur group is its own worse critic, and the Arkansas-Tennessee tornado emergency was not exceptionable in this instance. In spite of this, all agencies, both government and private, which were assisted during the tornado — and there were a lot of them — are singing the praises of the organized radio amateur who makes his time, facilities and sweat available to the public in time of disaster.

In all, several hundred amateurs participated in this emergency, both in the disaster area itself and outside in supporting roles. All are deserving of the highest praise for their efforts. It should be obvious from the above that no particular effort has been made to list the call letters of those who participated, but most reports received included long lists which we have not included for space reasons. To all these, our felicitations for a good job well done. And one last thought — they also served who stood by *without transmitting* so that those handling emergency traffic could do so that much easier and quicker.

Strays

Coaxial or feed-through condensers of the type used in suppressing automotive noises as specified in "Automotive Radio Noise Elimination," by Brooks H. Short, W9DPI, (April, 1952, QST, p. 17) are now available from Sprague Products Company, North Adams, Mass., and Cornell-Dubielier Corporation, South Plainfield, N. J.



ARTICLES OF ASSOCIATION

Be it known that we, the subscribers, do hereby associate ourselves as a body politic and corporate pursuant to the statute laws of the State of Connecticut regulating the formation and organization of corporations without capital stock and the following are our Articles of Association:

Article 1:

The name of our corporation shall be *The American Radio Relay League, Incorporated*. Our corporation commenced its corporate existence as the American Radio Relay League, Incorporated, when its Articles of Association were approved by the Secretary of the State of Connecticut on January 29, 1915. The original Articles of Association were subscribed by Hiram Percy Maxim, Clarence D. Tuska and Lawrence A. Howard. The affairs of the corporation have since that time been continuously administered by a Board of Directors selected by the membership; and the present Directors, subscribers hereto, are the lawful successors and associates of the incorporators.

Article 2:

The purposes for which our corporation is formed are the following: the promotion of interest in amateur radio communication and experimentation; the relaying of messages by radio without charge; the furtherance of the public welfare; the advancement of the radio art; the fostering and promotion of intercommunication by electronic means for the personal benefit of the members and without pecuniary gain; the fostering of education in the field of electronic communications; the dissemination of knowledge and information by electronic means; the printing and publishing of documents, books, magazines, newspapers and pamphlets necessary or incidental to any of the above purposes. No part of the assets or income of our corporation shall be the property of the members or any of them, but such assets and income shall be devoted exclusively to the purposes herein set forth.

Article 3:

The corporation is located in the town of West Hartford, County of Hartford and State of Connecticut and the address of the principal office is 38 LaSalle Road.

Article 4:

The name of the agent upon whom process may be served is A. L. Budlong and his address is 38 LaSalle Road, West Hartford, Connecticut or upon his successor as Secretary of the Corporation.

Article 5:

The affairs of this corporation shall be governed by a Board consisting of not less than five, nor more than seventeen Directors who shall be elected by the members for terms of two years.

The present Board of Directors and the expiration date of the term of each Director, are:

Alexander Reid, 240 Logan Avenue, St. Lambert, P. Q., January 1, 1952

John H. Brabb, 417 Ford Bldg., Detroit 26, Michigan, January 1, 1952

Victor Canfield, P. O. Box 965, Lake Charles, Louisiana, January 1, 1952

Goodwin L. Dosland, Moorhead, Minnesota, January 1, 1952

John R. Griggs, 10412 Don Pico Rd., RFD 2, Spring Valley, Calif., January 1, 1953

Lamar Hill, 104 Myrtle, Cochran, Georgia, January 1, 1952

Kenneth E. Hughes, 810 W. Orange Avenue, S. San Francisco, Calif., January 1, 1952

William H. Jacobs, Route 6, Raleigh, N. C., January 1, 1953

Joseph M. Johnston, 423 Monmouth Avenue, Bradley Beach, N. J., January 1, 1953

Alvin G. Keyes, 1201 Merchants Nat'l Bank Bldg., Cedar Rapids, Ia., January 1, 1952

Wesley E. Marriner, 844 North Galena Avenue, Dixon 7, Ill., January 1, 1953

Walter Bradley Martin, 1033 Arbuta Road, Abington, Pa., January 1, 1952

Franklin K. Matejka, P. O. Box 212, Estes Park, Colo., January 1, 1953

A. David Middleton, 9 Kay Road, Tijeras, N. M., January 1, 1953

Percy C. Noble, 37 Broad Street, Westfield, Mass., January 1, 1953

R. Rex Roberts, 837 Park Hill Drive, Billings, Mont., January 1, 1953

Their successors shall be elected by mail vote in accordance with rules and regulations prescribed by the Board of Directors in the By-Laws. Directors may be elected to represent specific geographical areas as may from time to time be prescribed in the By-Laws. The Board shall meet annually during the first quarter of each year at a time and place to be fixed by the President upon at least forty days' notice. Special meetings of the Board shall be called by the President upon written request of at least one-half the membership of the Board as then constituted.

Article 6:

At the time of the election of each Director there shall also be elected a Vice-Director who shall have power of succession to the office of Director as hereinafter prescribed. No person shall be eligible for the office of Vice-Director who does not possess the qualifications herein specified for the office of Director.

Article 7:

During the intervals between meetings of the Board of Directors the affairs of the corporation shall be administered by an Executive Committee consisting of the President, the First Vice-

President, the General Manager and one member of the Board of Directors designated by the Board. The Board of Directors, in its discretion, may also appoint from amongst the officers, directors, or employees of the League not more than three additional members of the Executive Committee to serve for fixed terms between regular meetings of the Board of Directors. The Executive Committee shall meet at the call of the President, but no less often than bi-monthly. The Executive Committee may in its discretion submit for determination or decision by the members of the Board of Directors by mail vote any proposal pending before the Executive Committee. When such submission is made, it shall be made in precise terms embodying the text of a proposed resolution. Such resolution shall be deemed adopted upon the receipt of the affirmative mail votes of at least 60% of the members of the Board. Otherwise, it shall be deemed rejected. Such action shall be binding upon the Executive Committee.

Article 8:

A vacancy in the Board of Directors shall be deemed to occur upon the death, resignation or refusal to act of any Director. Upon the occurrence of such vacancy, the Secretary shall proclaim it and thereafter the duties of the Director shall be assumed by the Vice-Director, and the Vice-Director shall hold the office of Director for the remainder of the term for which he was elected Vice-Director. Should the office of both Director and Vice-Director be vacant, the vacancy shall be filled by appointment of the President.

Article 9:

The officers of the corporation shall be a President, not more than three Vice-Presidents, a Secretary and a Treasurer who shall be elected by the Board of Directors at their meeting in 1952 and biennially thereafter.

Article 10:

The Board of Directors may from time to time adopt By-Laws not inconsistent with these Articles and may alter, amend or repeal such By-Laws.

Article 11:

The membership of the League shall consist of (a) full members who shall be entitled to all rights and privileges of the League and (b) associate members who shall be entitled to all rights and privileges of the League except the right to vote for Directors and Vice-Directors and the right to hold office. The Board of Directors shall by appropriate By-Laws specify the requirements for membership and classes of membership provided, however, that the Board of Directors

shall not terminate or reduce the rights of any member except for the lapse or termination of a condition now required as precedent to the exercise of such rights. Nothing herein contained shall preclude the Board of Directors from expelling a member upon good cause shown and after notice and an opportunity to be heard.

Article 12:

No person shall be eligible for the office of Director, Vice-Director or President who has not been a member of the League for at least four years or who does not hold a valid authorization as a radio amateur in accordance with the applicable federal laws and regulations prevailing at the time of his election. No person shall be eligible for the office of Director, Vice-Director or President who is commercially engaged in the manufacture, sale or rental of radio apparatus capable of being used in radio communication, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

Article 13:

The Board of Directors shall employ a General Manager who shall hold office for a term and upon such compensation as the Board and he may agree upon. The General Manager shall manage the affairs of the League under the direction of the Board of Directors. He shall be deemed a member of the Board, but without vote. He shall attend all meetings of the Board. He shall collect all monies due the League and turn them over to the Treasurer. He shall certify the accuracy of bills or vouchers on which money is to be paid and shall draw and countersign all checks. He shall have charge of the books and accounts of the League and shall furnish to the Board of Directors from time to time such statements as may be required. He shall conduct the general correspondence of the League and shall keep full records. He shall be in responsible charge, under the Board of Directors, of all property of the League. He shall, under the general direction of the Board of Directors, employ such personnel as may be necessary for the effective accomplishment of the purposes of the League. He shall be the General Manager of the League publications. He shall prepare and submit to each annual meeting of the Board of Directors a comprehensive report of the progress and status of the affairs of the League. He shall perform such other duties as may be assigned to him by the Board of Directors. His entire time shall be devoted to the affairs of the League. He shall furnish a bond satisfactory to the Board of Directors, the expense of the same to be borne by the League.

• On these pages we reproduce the new Articles of Association of The American Radio Relay League, Inc., adopted by the Board of Directors at its 1951 meeting. On the following pages are the new By-Laws and supplementary regulations just adopted by the Board at its May meeting to become effective July 1, 1952.



BY-LAWS

Members

1. Pursuant to Article 11 of the Articles of Association, the following membership requirements are established:

(a) To be eligible for full membership an applicant must be a resident of the United States or its possessions or of Canada and must be either:

(1) the holder of either an amateur radio station license or an amateur radio operator's license, issued by the administration of the country of which he is a citizen. Such full membership shall be granted for no longer than one year at a time, and the holding of an amateur radio license must be demonstrated before each renewal for an additional year; provided, however, that if such a full member becomes without amateur radio license during a year for which he has been accepted as a full member, he shall continue to possess the rights of a full member until the expiration of the year; or

(2) a person who has held continuous and unbroken membership in the League since May 15, 1934.

(b) Any person interested in amateur radio shall be eligible to associate membership. Upon attaining possession of an amateur license, an associate member shall be transferred to full membership upon his application therefor, if he is otherwise eligible.

2. Applications for membership shall be submitted to the Executive Committee and a majority vote of this Committee shall elect to membership. The Committee shall not elect any applicant whose character, reputation or conduct would make him, in its opinion, an undesirable member. The Committee may delegate the ministerial function of granting (but not denying) applications for membership as to which no question is raised or suggests itself under these By-Laws.

3. The Secretary shall notify members of the expiration of their membership not less than thirty days in advance thereof.

4. The dues of members of any class shall be \$4.00 per year in the United States & Possessions, \$4.25 in the Dominion of Canada, payable annually in advance.

5. Provided that a full member is without sight, or is the husband or wife, brother or sister, son or daughter, father or mother of another full member living at the same address paying dues at the rate of \$4.00 per year in the United States & Possessions or \$4.25 in the Dominion of Canada, he may at his request pay dues of \$1.00 per year, in advance, but without the right to receive "QST"; said membership to be concurrent with that of the member receiving "QST".

General Provisions as to Officers and Directors

6. Every officer, director and vice-director of the League shall serve and continue in office until his successor shall have been elected and qualified.

7. All officers, directors and vice-directors shall serve without compensation in any form. This shall not preclude the reimbursement, and the League shall reimburse the reasonable and necessary travelling expenses of officers and directors from their homes to the place of meeting of the Board of Directors or of the Executive Committee and return to their homes. This section shall not be construed to prevent the employment, for agreed compensation, of the Secretary, the Treasurer, and any Vice-President other than the first Vice-President, by the League in other capacities.

8. No person shall be an officer, director or vice-director of the League unless at the time of his assuming office he is a member of the League.

Directors

9. The members of the Board of Directors shall be the President, the Vice-Presidents, one director from each of the several territorial divisions of the League and the General Manager.

10. The President, the Vice-Presidents and the General Manager shall possess all of the rights and duties of directors save the right to vote, provided, however, that the President shall be required to cast a vote on any matter as to which a tie is found to exist.

11. Without restriction of his rights and duties as prescribed by the Articles of Association, the Canadian Director is requested not to vote on any matter involving recommendations or expressions of attitude concerning the exercise of the power of the Federal Government of the United States of America in the regulation of radio communication, or in matters of purely domestic United States interest.

12. Each director shall keep himself informed as to conditions and activities in his territorial division and as to the needs and desires of the members therein in order that he may faithfully and intelligently represent the true interests of such members. He shall attend all meetings of the Board. At least twenty days prior to each annual meeting of the Board of Directors each director shall file with the Secretary a written report on the status of the affairs of the League in his division, together with a statement of his recommendations as to any actions required for the effective administration of the objectives and affairs of the League.

13. On any date not later than noon of the twentieth day of September of an election year in

any division, nominating petitions signed by ten or more full members of a division and naming a full member of the division as candidate for director, may be filed with the Secretary. The Secretary shall solicit such petitions in the August and September issues of "QST" in each election year by a notice that will show the name of the incumbent.

14. The Executive Committee shall delete the name of any nominee who may be ineligible to election and the name of any who may withdraw by written communication. The remaining names shall be listed on a ballot, in alphabetical order. If there be but one eligible nominee, the Executive Committee shall declare him elected without balloting by the membership. If there be more than one eligible nominee, then during the first week of October the Secretary shall send by mail to every person who on the twentieth day of September of that year was a full member of the League in the divisions in which elections are being held, a ballot listing the candidates for director in his division, and a return envelope, soliciting a vote for one name. The ballot shall contain a copy of By-Laws 13 and 15.

15. The Executive Committee shall appoint a committee of three tellers and shall arrange to have a certified public accountant present to certify the results of the balloting; but any member of the League who shall deliver to the Secretary on or before the first day of October of election year a written petition signed by at least ten full members of a division, stating their desire that he witness the counting by the committee of tellers of the ballots from that division, shall be permitted to do so and shall be accorded reasonable opportunity to satisfy himself of the correctness of the count reported by the committee. Ballots, to be counted, shall reach the Secretary not later than noon of the twentieth day of November of election year. No outer envelopes marked as containing ballots shall be opened until the meeting of the committee of tellers held for the purpose of counting the ballots. The committee of tellers shall meet at the headquarters office of the League as soon thereafter as possible and in the presence of each other shall open the envelopes containing ballots and shall count the vote, after first eliminating the ballot of anyone disqualified from voting. They shall forthwith prepare and sign in the name of the Executive Committee a report of the results of the vote, declaring duly elected as new directors the candidate in each division receiving the greatest number of votes therein; and they shall turn over all their records and ballots to the Secretary for presentation at the next annual meeting of the Board of Directors.

16. If there be no eligible nominee, the procedure provided for in By-Laws 13, 14 and 15 shall be repeated three months later and if there again be no eligible nominee, the person then holding the office of director shall continue in office (subject to the provisions of Article 8 of the Arti-

cles of Association), until the next regular election established by these By-Laws for the division.

17. Simultaneously with each election for director of any division there shall be held an election for vice-director of that division. All of the provisions of By-Laws 1, 13, 14 and 15 shall be applicable to the election for vice-director. Should it appear that any one person is nominated for the office of director and vice-director, his nomination shall be deemed for director only and his nomination for vice-director shall be void.

18. A director and a vice-director shall be elected in each even-numbered year in each of the following divisions: Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf. A director shall be elected in each odd-numbered year in each of the following divisions: Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern. The term of each director shall be for two years.

19. The terms of all directors and vice-directors shall begin at noon on the first day of January of the year after that in which they are elected.

20. Meetings of the Board of Directors shall be held at West Hartford at a place to be designated by the President and notified by the Secretary. Meetings may be held at places other than West Hartford provided that specific provision is made therefor by appropriate action of the Board of Directors or of the Executive Committee at least sixty days prior to the date of the meeting.

21. Special meetings of the Board of Directors may consider or act upon only those matters which are set out in the request provided for in Article 5 of the Articles of Association. The call for any such meeting shall specify the matters to be considered.

22. A majority of the members of the Board of Directors or of any committee shall constitute a quorum at any meeting of the Board or committee.

23. Prior to any regular meeting of the Board of Directors, the Secretary, upon consideration of the reports of the officers and directors, shall establish an agenda for the meeting. Proposals for amendment of the agenda or for the deletion or addition of items shall be the first order of business.

24. On questions of order and procedure not otherwise determined by these By-Laws the provisions of the current edition of *Robert's Rules of Order* shall prevail.

25. In accordance with the provisions of Article 5 of the Articles of Association and for the purpose of By-Laws 9, 12, 13, 14, 15, 17 and 18, the following territorial divisions are established:

ATLANTIC DIVISION, those portions of the states of New York and New Jersey not included in the Hudson Division, the states of Pennsylvania, Maryland and Delaware, and the District of Columbia; CANADIAN DIVISION, the provinces

of Nova Scotia, New Brunswick and Prince Edward Island, Ontario, Quebec, Saskatchewan, Manitoba, Alberta, British Columbia, and Newfoundland, Labrador, the Northwest Territories and the Yukon Territory; CENTRAL DIVISION, the states of Illinois, Indiana and Wisconsin; DAKOTA DIVISION, the states of Minnesota, North Dakota and South Dakota; DELTA DIVISION, the states of Louisiana, Mississippi, Arkansas and Tennessee; GREAT LAKES DIVISION, the states of Kentucky, Michigan and Ohio; HUDSON DIVISION, the counties of New York, Bronx, Richmond, Kings, Queens, Nassau, Suffolk, Westchester, Rockland, Putnam, Orange, Ulster, Dutchess, Columbia, Green, Albany, Rensselaer and Schenectady of the state of New York, and the counties of Bergen, Passaic, Morris, Essex, Union, Middlesex, Monmouth, Hudson and Ocean of the state of New Jersey; MIDWEST DIVISION, the states of Nebraska, Iowa, Kansas and Missouri; NEW ENGLAND DIVISION, the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut; NORTHWESTERN DIVISION, the states of Washington, Oregon, Montana and Idaho, and the Territory of Alaska; PACIFIC DIVISION, that portion of the state of California not included in the Southwestern Division, the state of Nevada, the Territory of Hawaii and the United States Possessions in the Pacific; ROANOKE DIVISION, the states of Virginia, West Virginia, North Carolina and South Carolina; ROCKY MOUNTAIN DIVISION, the states of Colorado, Wyoming and Utah; SOUTHEASTERN DIVISION, the states of Georgia, Florida and Alabama, the United States Possessions in the Caribbean, and the Canal Zone; SOUTHWESTERN DIVISION, the counties of Imperial, Inyo, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara and Ventura of the state of California, and the state of Arizona; WEST GULF DIVISION, the states of Texas, Oklahoma and New Mexico.

Officers

26. The President shall preside over all meetings of the Board of Directors. He shall, subject to instruction from the Board of Directors, represent the league in its relationships with the public and the various governments, governmental agencies and officials with which the League may be concerned and shall be the official spokesman of the Board of Directors in regard to all matters of League policy.

27. In the absence or disability of the President, the First Vice President shall preside at meetings of the Board of Directors and in general act in his stead. No Vice President other than the First Vice President shall have this power of succession. Should the First Vice President be also absent or unable to act, the Board of Directors shall designate an Acting President, provided that no special meeting shall be called for this purpose.

28. The Secretary shall record the proceedings of all meetings of the Board and of the Executive Committee. He shall promptly furnish copies of the minutes of these meetings to all officers and members of the Board and publish them in "QST". He shall be responsible for the maintenance of the corporate status of the League and the filing of all reports and certificates which may be required of the League under the corporation laws of the State of Connecticut. He shall be the archivist of the League and for the performance of his such duties may call upon the General Manager for such clerical and stenographic assistance as he may require. To the extent that may from time to time be required by law, he shall act as agent for the service of process, but only while present in the State of Connecticut, and he is not authorized to accept service of process elsewhere.

29. The Treasurer shall be the recipient of all monies of the League and shall deposit the same in the name of the League in a depository specified by the Board of Directors. He shall sign checks drawn by the General Manager in payment of obligations known by him to be proper and authorized. He shall make a report at the annual session of the Board of Directors and shall attend meetings of the Board. He shall furnish bond satisfactory to the Board, the expense of such bond to be borne by the League. He shall be *ex officio* a member of the Finance Committee provided for in By-Law 30 and shall, on consultation with and subject to the general supervision of the Finance Committee, invest and reinvest the surplus funds of the League in securities of the variety in which a life insurance company is authorized by law to invest.

Standing Committees

30. The following standing committees are established:

Finance Committee
Planning Committee

31. Each such committee shall consist of three members, one of whom shall be specifically designated as Chairman. Appointments shall be made by the President during annual meetings of the Board of Directors and shall be for a term of one year. Standing committees shall make written annual reports at least thirty days prior to each annual meeting of the Board of Directors.

32. The Finance Committee shall act as advisor to and supervisor of the Treasurer in regard to the investment of the League's funds. The Chairman of the Finance Committee may direct from time to time that the business of the committee may be transacted by mail.

33. The Planning Committee shall act as a reference body to which the Board may from time to time by resolution refer problems requiring special study, planning and recommendation. Any such resolution of reference shall describe with particularity the problem to be studied, the

general character of the investigation required and the scope of the report desired.

Official Publication

34. There shall be an official publication maintained by the League, in the form of a monthly magazine, the name of which shall be "QST". A copy of this magazine shall be supplied each month to every member of the League in good standing. The general management of this magazine shall be in the hands of the General Manager. The policy of the magazine shall be determined by the Board of Directors.

Amendments

35. These By-Laws may be amended by a three-quarters vote of the directors present at any meeting; or (provided due notice of the proposed amendment shall have been submitted to every director at least thirty days in advance), they may be amended by a two-thirds vote.

36. Without changing their import, the Secretary may from time to time, on notice to the members of the Board of Directors, renumber these By-Laws so as to serve the purpose of ready reference.

37. The present By-Laws shall become effective July 1, 1952.

RULES AND REGULATIONS CONCERNING AMERICAN RADIO RELAY LEAGUE CONVENTIONS

1. An American Radio Relay League convention is defined as a meeting of persons interested in amateur radio, of any regular American Radio Relay League Division or of any State or Province therein, when such meeting has been authorized and is conducted as hereinafter provided.

2. Neither the name of the American Radio Relay League, nor the initial letters thereof, nor its emblem, shall be used in connection with any meeting or convention, or in the advertising thereof, save such as above defined.

3. Before such a convention is held, the parties desiring to conduct the same shall obtain the approval of the director of the division in which the convention is to be held, by an application setting forth the place and date of the proposed convention, the territory to be embraced, the particular purpose to be served thereby, the clubs, associations or groups who propose to sponsor it, and the names and addresses of the officers chosen to conduct it. When the director is satisfied that the approval of such convention will be in the

best interests of the League, he shall submit the application to the Executive Committee for its formal approval. Upon such final approval the headquarters shall notify the chairman or secretary of the convention group. The management, program and financial plans of every such convention shall be subject to the approval of the director of the division in which the convention is to be held.

4. Notwithstanding the foregoing provisions the Board of Directors may, at any meeting, authorize or direct, upon such terms as it may prescribe, the holding, as a National Convention, of a meeting of persons interested in amateur radio from throughout the operating territory of the League.

5. The General Manager, with the approval of the Executive Committee, is also authorized to provide (upon the request of the directors affected), for the holding of a State Convention designed for amateurs residing in any state which lies partly in each of two divisions.

RULES AND REGULATIONS CONCERNING AFFILIATED SOCIETIES

1. It shall be the policy of the League to affiliate with itself local non-commercial amateur radio societies of kindred aims and purposes with a view to forming a homogeneous organization for unity of action in matters affecting amateur welfare.

2. Any such society which suitably expresses its sympathy with and allegiance to the aims and policies of the League in accordance with regulations determined by the Communications Manager with the approval of the Executive Committee, and which upon investigation is found to be worthy and well qualified, may be declared duly and truly affiliated with the League by the Communications Manager with the approval of the Executive Committee and a certifi-

cate shall thereupon be issued the society in token thereof. The Executive Committee shall have the authority to refuse affiliation to any society if in its opinion such affiliation would be harmful to the best interests of the League.

3. The affiliation of any society may be terminated and its charter recalled by the Executive Committee at any time for any cause deemed prejudicial to the best interests of the League.

4. At least 51% of the voting members of an affiliated society must be full members of the League.

5. At least 51% of the members of an affiliated society must be licensed radio amateurs.

6. The Communications Manager shall be

(Continued on page 128)

• Technical Topics -

"How Come No 160?"

MOST of us of pre-World-War-II days' operation can recall the fine QSOs on 160 meters, but since the war very little activity has been noticed. The 160-meter band has extremely good possibilities and promises a great deal of enjoyment and experimentation. The author has been operating mobile on 75-meter 'phone since two days after the go-ahead signal for mobile operation on all bands and, like many other hams, has had an immense amount of enjoyment and opportunity for experimentation with the low-frequency antenna systems required for mobile operation.

Daylight operation on 75 is quite limited with the average mobile installation of about 20 watts, and, after reference to various textbooks, the reasons for the limited signals are readily understood. Attenuation of the ground signal in the 2- to 4-Mc. region is quite pronounced. For instance, tests were conducted on both bands, with a given output of 20 watts on 'phone. The receiving end indicated the following signal levels: on 3980 kc. the signal was 1500 microvolts at approximately 7 miles from the transmitter, and on 1920 kc. the signal was 10,000 microvolts at 7 miles from the transmitter. This experimentation was conducted at various times and under various conditions, but good engineering practice was used and the above figures were compiled as an average of the findings. Near the salt water or any areas of exceptionally moist and good ground such as marshes, etc., the over-all gain was much more pronounced. But over average terrain these were the readings. It should also be brought out at this time that the antenna used on 160 was the same home-brew antenna that had been grid-dipped to 3965 kc., complete with capacity hat. Even though the antenna was not resonant to the 160-meter band, the antenna loaded in fine style by adding a variable series inductance.

Although fine communication on 75 mobile 'phone has been experienced in the daylight hours, it was the complete *kaput* of contacts in the evening that prompted this look into the possibilities of 160 mobile.

About a year ago the rig was placed on 160 and, for a receiver, the low-frequency end of the car's broadcast receiver was modified by removing a few turns from the oscillator coil and then re-peaking the receiver at about 1900 kc. For normal broadcast reception the receiver with the extra-good ham antenna is fine, and this little receiver, a cheap auto radio in comparison to existing types on today's market, has turned out to be very excellent, and a good number of mobile QSOs have been realized on the 160-meter band.

¹ See, also, Beers, "The Wavelength Factor," *QST*, February, 1952.

Two facts have been mentally recorded while operating on 160 that make the band ideal for mobile and in some respects superior to 75 meters. Excellent contacts of about twice the distance for ground wave have been noticed on 160—over 75-meter operation,¹ and a QSO in the evening is excellent on 160 whereas on 75 it's *kaput* because of the gallons of r.f. in the air.

The two reasons for good operation on 160 that have just been brought out are fine, but of course all is not gold that glitters, and the disadvantages to be encountered are as follows: The QSOs obtainable on 160 mobile are reduced, of course, because of the limited activity on the band. So let's get on the 160 mobile and fixed band. There's a well of enjoyment here, and already about 25 stations active in this area.

—R. A. Roberge, W6OZS



July 1927

. . . Boyd Phelps, 2EB, and Technical Editor Robert S. Kruse "formally opened" the amateur $\frac{1}{4}$ -meter band with gear brought to the Hudson Division Convention.

. . . E. M. Guyer and O. C. Austin, 9AKR, recount their investigation into 5-meter techniques. Both are constructing new gear for operation at one meter and lower.

. . . Chester W. Rice discusses phenomena associated with short-wave transmission and reception and explains the "skip" effect in a detailed analysis.

. . . Ross A. Hull's "Some Light on Transmitter Tuning" features a handy "Growler" monitor built into a completely shielded container of the hardware-store variety.

. . . "A Constant-Frequency Transmitter," by W. H. Hoffman, 9EK-9XH, contends that crystal control is not the only approach to signal stability.

. . . To minimize transients, a wave is interrupted by varying the capacities of coupling condensers in the novel keying system of A. G. Shafer, 3ACF.

. . . A laboratory instrument capable of measuring capacity, power factor, resistance and inductance is the subject of an article by J. Katzman.

. . . An "S52 holder" is among new available equipment, marketed by Radio Engineering Labs of New York City to facilitate use of this popular tube.

. . . Amateurs coöperated with the Army and Navy in Atlantic Coast maneuvers wherein a Black Force mounted an attack by sea on a defending Blue Force.

. . . Putnam Baffinland, Wilkins Arctic, University of Michigan Greenland, Borden Field Arctic and Marshall-Field Alaska expeditions are utilizing amateur radio.

. . . Enthusiasm for Twenty runs high as reports continue to pour in concerning amazing low-power daylight DX contacts made throughout the world.

. . . Outstanding amateur stations pictured and described are those of Edward G. Raser, 3ZI, Trenton, N. J., and H. G. Pearce, 6DDO, Los Angeles, Calif.

The World Above 50 Mc.

12.5-13.00 2.300 2450 3.300 4.300 5.650-5925 10,000-10,500 21,000-22,000 3.000-9

CONDUCTED BY E. P. TILTON,* WIHDQ

IT was just a year ago that FCC touched off an unprecedented march on its examining rooms by opening up for business on the Novice and Technician classes of license. We don't have complete figures for the year, of course, but present licensing rates make it certain that well over 12,000 new hams will have been brought into our hobby through these new licensing avenues alone, when the June and July figures are in.

We need only listen above 3700 kc. to see what all this has meant to occupancy of the 80-meter band. That 50-ke. Novice segment is literally boiling with signals, around the clock. The effects on the world above 50 Mc. are less obvious, but perhaps no less important. Two-meter operators in or near our more densely-populated regions have seen a marked change in operating habits and occupancy already, and the effects are still on the increase. Where there was universal complaint over lack of activity a year ago, today we find use of the 2-meter band approaching the saturation point in some spots, and almost everywhere there is more doing on 2 than at any time since the simple modulated oscillator and superregenerative receiver went out of style some years ago.

Most noteworthy is the reversal of the trend toward low-end crowding. No longer is it necessary to be in the bottom 500 kc. of the band to get contacts. We're tuning the whole band again, and the 145-Mc. low end of the Novice assignment is responsible for it.

As will be seen from the minutes of the recent ARRL Board Meeting, printed elsewhere in this issue, our Directors have petitioned FCC to open 51 to 53 Mc. to Novice use. If FCC acts favorably on this request, we may expect a similar expansion in utilization of that band. All of us agree that 6 could stand it. There has been a growing tendency on the part of 6-meter men to become DX hunters exclusively, making use of the band only when it is open, or expected to be. There is regular use of the band here and there, but the total occupancy is all too small a percentage of what the band is capable of accommodating. DX hunting on 6 is fun, and our efforts in that line have resulted in some noteworthy contributions to the store of wave-propagation knowledge, but the band should not live by DX alone. It is too useful a hunk of spectrum for local communication to be allowed to lie almost unused for nine months in the year!

The most frequently voiced objection to Novice operation on the v.h.f. bands runs something like this: "Sure, that's all well and good to promote activity on the v.h.f. bands, but how is the Novice going to build up his code speed to the

General Class level if he yaks away his first year on 'phone?" This line of reasoning ignores the fact that thousands of beginners have made the grade in years gone by without having c.w. operating experience. They learned the code by listening, and by practice with others who were learning.

Which brings up a possible use of the v.h.f. bands that has yet to be fully exploited — the formation of Novice nets for code-practice purposes. Surely the swapping of formulas, in the manner of the usual 80-meter QSO, is not the ideal form of code practice. An hour's work each evening with A2 emission, chewing the rag with nearby associates on 6, 2, or 1½ would do a lot more good. It would be more fun, too, in view of the congestion of the Novice segment of the 3.5-Mc. band. Some of us who have been around a few years could stand the code practice, too. When do we start?

Here and There on the V.H.F. Bands

The May issue of *QST* had not been out long before we heard about a couple of errors in the tabulation of scores for the V.H.F. Sweepstakes. We did W6GCG dirt by listing his score as 34 instead of 340. Getting it right moved him up from 9th to 4th place in the Santa Clara Valley Section listing. Worse yet, we transposed two figures in the score of W2DLQ, listing him as having 846 points instead of the 864 he actually rolled up. What's so important about 18 points, do we hear someone ask? Well thereby hangs a tale, for that slight change put W2BNX (850) just a hair above W2DLQ, and we listed him as winner in the Lake Success Radio Club standing. This didn't set too well, as W2BNX was the fellow who promoted the club members into turning out in force for the Contest! We're really sorry, boys; we do try to check contest scores carefully, but things like these happen once in a while.

Would anybody like to work Chile on 50 Mc.? It's never been done from this country, despite valiant efforts in that direction by CEIAH. Now the fellow all 6-meter men knew so well as HC2OT is going to have a try at it. Steve, W5BR, ex-W5DNN-HC2OT-CO2JF, is soon to leave for an assignment that will keep him some time in a likely location in Northern Chile. Though the solar cycle offers little chance for F_2 DX, Steve will be taking gear for 2 and 6 meters, as well as for 10, 15, and 20. It is an amateur axiom that we never know what we can or cannot work until we try, and many paths have been worked when available facts made it seem useless to try. One thing's sure — if 6-meter DX can be worked from Northern Chile, the man who made 6-meter history in Ecuador and Cuba is the fellow to do it! And we know that CEIAH will be glad to have some company on 6 and 2 meters.

DX of another sort, but hardly less desired by 6-meter men who need Nebraska for 50-Mc. WAS, should be available from June 29th to July 12th, when W9EET/9 will be operating in Lincoln, Neb. The rig will run at least 50 watts, and Gordon hopes to have a beam up. Frequency will be 50.7 Mc.

Up to the end of May, the 50-Mc. DX season was well below par, but all hands are hoping at this writing that this is only a matter of delayed action. There is difference of opinion as to the relation, if any, between the sunspot cycle and incidence of sporadic-E ionization. Some observers see inverse correlation, while others feel that E_s is more prevalent in years of high sunspot number. We are passing through

* V.H.F. Editor, *QST*.

the low years at present, so the next few years should shed light on the subject. Of interest in this connection is the summary of the DX season enjoyed by our friends in the Antipodes, as reported by Cliff Betson, ZL1MQ, V.H.F. Editor of the NZART publication, *Break In*.

Cliff says that things got underway late, and the season was shorter than some, but conditions were excellent while it lasted. The first good openings came in early December, corresponding to our June. VK9XK, Papua, was a star performer, working nearly every 50-Mc. ZL until he left the band in the middle of January. He worked 147 stations, 75 per cent of them ZLs, winning the ZL WAD award, ZL to VK9 is equal to or greater than W1 to W6 DX! ZK2AA on Niue worked 4 ZLs using a 2E26 doubler and a 10-meter beam. On Dec. 30th, the peak day of the year, all ZL districts, VK2, 3, 4, 5, 6, 7, 9, and ZK2AA were all workable on the band at the same time. This session covered from 11.5

degrees East to 170 West, or 75 degrees longitude, and extended over 38 degrees latitude, from 8 to 46 south. (U.S.-Canadian activity covers 58 degrees longitude and 24 latitude!) From VK6 to ZL1 and 2 is 2500 miles, yet the VK6s were in solid for hours. If June 30th is as good here, most Ws and VEz will be well satisfied!

Ever notice how few fellows you hear making use of the opportunities for v.h.f. DX that a good aurora opening affords? W2ORI, Lockport, N. Y., says that the 2-meter aurora gang would make a good club — you hear the same calls time after time. The only trouble is, says John, there aren't enough members, particularly in certain states, like Maine, New Hampshire, Vermont, Rhode Island, and Delaware, for instance. There is at least some 2-meter activity in these states; doesn't anyone there have a horizontal array, or code?

In watching for aurora members of the "club" overlook few bets. They watch their TV screens, or have their families and friends do so and let them know when those streaks appear. (This one is particularly good if you have to aim north or south for your TV reception, and are at least 35 or 40 miles from a low-band station.) They monitor WWV for the propagation warnings at 19½ and 49½ minutes past the hour. They get the advance dope by listening to W1AW regularly. They watch for wavy signals on 75, or the short-wave broadcast bands. They know that better than average signals on 10, with the band staying open for DX later than usual in the evening, are an almost certain tip-off. And they don't just aim north in looking for aurora signals. Some openings, including the widespread one of May 26th, brought in signals best with beams here in the East aimed almost west, while WØEMS, Adair, Iowa, says that his reception is usually best at about NNE.

The boys who work the aurora for all it's worth think it one of the most intriguing angles in the whole v.h.f. game. We feel that the fellows who don't go in for it are missing something. What's more, they are passing up a chance to help in a scientific study. Are you contributing reports for the Cornell University Aurora Project? If not, we invite you to send for reporting forms now, and join in the fun. A card to the writer will start forms on the way.

W2NLY, Oak Tree, N. J., reports aurora DX on 144 Mc. five nights in a row, beginning with April 29th. The May 3rd session was the best, with W9UCH, Ft. Wayne, Ind., reaching S8 on peaks, and W9EHH, McLean, Ill., worked, extending Jim's best 2-meter DX to 795 miles.

Nowhere is "what's going on" at the local level better reported than in the hundreds of radio club papers. You find these everywhere, and they run all the way from single-sheet mimeographs to beautifully-printed jobs gotten out by some of the larger radio-club councils. Most of the outfits producing them are ARRL-affiliated clubs, so many of them pass across our desks here at Headquarters. Noteworthy to the writer is that, in the last few months, almost every club bulletin we've seen has at least some v.h.f. news, and not a few of them devote a goodly portion of their space to it.

In QRM (Puget Sound Council of Amateur Radio Clubs) we find a list of 43 2-meter stations active in Longview and Portland, Oregon, and Seattle and Tacoma, Wash., contributed by W7PXB. He reports that the VE7 activity is now all horizontal, and there are stations on every night looking for more business. Activity gets underway as early as 6 p.m. Olympia, Wash., got its first shot of 420-Mc. interesting recently as the result of operation on that band by W7s KNV, HPJ, and CMX.

Working on 2 around Philadelphia must be unhealthy these days. Now we understand, from W2QED, that W2PAU is having a session in the hospital. Don't be long, Brownie, this is the wrong time of year for good v.h.f. men to be out of circulation!

One of the elaborate c.d. communications set-ups for 2-meter work we've heard of is the Orange County station of the Zone 3 New York State Civil Defense System, described by W2PCQ. Located 1385 feet above sea level about 10 miles from Middletown, N. Y., the station covers all seven counties of Zone 3, and other points in Eastern New York, New England, Northern New Jersey, and Eastern Pennsylvania with ease. There is emergency power for operating two 2-meter transmitters, with a choice of high-gain or coaxial antennas. Operation is on 145.6 and 144.8 Mc.

Doings on 220 and 420

Until recently, the 220-Mc. band has been something of an orphan, with most of the experimenters skipping over it

2-Meter Standings

Call			Call		
States	Areas	Miles	States	Areas	Miles
W1HDQ	16 6	650	W5SWV	7 2	—
W1IZY	15 6	750	W5FBT	6 2	500
W1MNF	14 5	600	W5IRP	6 2	410
W1BCN	14 5	580	W5ONS	5 2	950
W1DJK	13 5	520	W5FSC	5 2	500
W1CTW	12 4	500	W5DFU	5 2	275
W1KLC	12 4	500	W5JLY	4 2	650
W2BAV	21 7	1175	W6ZL	2 2	1400
W2NLY	18 6	795	W6WSQ	2 2	1390
W2PAU	16 6	740	W6PJA	2 2	1390
W2AZL	16 6	—	W6GCG	2 2	210
W2SFK	13 5	—	W6EXH	2 2	193
W2DFV	13 5	350	W6ZEM	1 1	415
W2CET	12 5	405	W6GGM	1 1	300
W2DPB	12 5	500	W6YYG	1 1	300
W2QED	12 5	365	W5EP	17 7	—
W2FHJ	12 5	—	W5WSE	16 7	830
W2QNZ	12 5	—	W5WJC	21 7	775
W2BVU	12 4	260	W5BFQ	21 7	775
W2ORI	11 6	620	W5WRN	19 7	670
W2UTH	10 6	—	W5WV	18 7	1200
W3NKM	19 7	660	W5UKS	18 7	720
W3RUE	18 7	760	W5WSE	16 7	500
W3QKI	17 7	820	W5WSE	16 7	500
W3KWL	15 7	560	W5WSE	16 7	500
W3LNA	14 7	720	W5WSE	16 7	500
W3GKP	14 6	650	W5WSE	16 7	500
W30WW	13 6	600	W5WSE	16 7	500
W3KUX	12 5	575	W5WSE	16 7	500
W3PGV	12 5	—	W5WSE	16 7	500
W3LMC	11 4	400	W5WSE	16 7	500
W4MKJ	16 7	665	W5WSE	16 7	500
W4HHK	15 6	660	W5WSE	16 7	500
W4JDN	13 6	—	W5WSE	16 7	500
W4JFV	13 5	830	W5WSE	16 7	500
W4IKZ	13 5	650	W5WSE	16 7	500
W4JFU	13 5	720	W5WSE	16 7	500
W4OXC	13 7	500	W5WSE	16 7	500
W4CLY	12 5	720	W5WSE	16 7	500
W4JHC	12 5	720	W5WSE	16 7	500
W4OLK	12 5	720	W5WSE	16 7	500
W4FJ	12 5	700	W5WSE	16 7	500
W4LRR	5 2	900	W5WSE	16 7	500
W5JTI	14 5	670	W5WSE	16 7	500
W5QNL	10 5	1400	W5WSE	16 7	500
W5CVW	10 2	1180	W5WSE	16 7	500
W5MWW	9 4	570	W5WSE	16 7	500
W5AJG	9 3	1260	W5WSE	16 7	500
W5ML	9 3	760	W5WSE	16 7	500
W5ERD	8 3	570	W5WSE	16 7	500
W5VX	7 4	—	W5WSE	16 7	500
W5FEK	7 2	580	W5WSE	16 7	500
W5ABN	7 2	450	W5WSE	16 7	500

from 144 to 420 Mc. The Technician Class license is resulting in some signs of life on 220, however. It is somewhat easier to get equipment working efficiently on the lower frequency, and the band is working out nicely for local ragchewing. According to W21QR, each Sunday morning at 11 finds around a dozen stations on 220 in the New York area. These include W2s DZA, IQQ, MLX, BQK, KQ, ESW, BOD, HRN, QOX, KON, LWN, BZJ, IHW, IQR, and WG. W21QR also operates from a summer location on the North Shore of Long Island, near Huntington, from which point he has worked as far as High Point, N. J., some 90 miles distant. He would like to arrange schedules with WIs, particularly the group known to be working on 220 in the Boston area. He has a crystal-controlled rig with an 829B final on 220.5 Mc. A 12-element vertical array is used.

On 420 the prospects are bright for the best summer season yet. Not only are many more stations ready to go, but the quality of much of the equipment is vastly improved over that used in former years, particularly in the receiver department. Here are some of the better set-ups: W1CLS, Waltham, Mass. — 9903 tripler-amplifier on 432.38 Mc., 24-element horizontal array, crystal-mixer converter with HRO i.f. W1HDF, Elmwood, Conn. — 9903 tripler-amplifier on 432.1 Mc., 16-element horizontal array, crystal-controlled converter (described in June *QST*). W1HDQ, Canton, Conn. — 9903 tripler-amplifier on 432.4 Mc., 24-element horizontal array, crystal-controlled converter, W1PRB, Monroe, Conn. — low-power crystal control on 436.4 Mc., 40-element array, horizontal or vertical, crystal-mixer converter. W2EH, Collingswood, N. J. — 9903 tripler, 40-element array, APS-13 converter ahead of 2-meter receiver. W2QED, Seabrook, N. J. — 9903 tripler-amplifier, 435.6 Mc., 32-element horizontal array, 634 r.f., APS-13 converter into 2-meter receiver. W3RKQ, Wilmington, Del. — 9903 tripler-amplifier. W3BSV, Salisbury, Md., same. W3KFM, Baltimore, Md. — 9903 tripler on 433.5 Mc., 16-element horizontal with screen reflector, converted taxi receiver with 634 r.f. amplifier. W9ZHB, Zearing, and W9MBI, Coleta, Ill. — 9903 tripler-amplifiers, 430.6 and 434 Mc., both with crystal-controlled converters and 16-element horizontal arrays.

There is considerable 420-Mc. activity around Toronto and Hamilton, Ontario, according to VE3EAB, writing in the *Mohawk Journal*. He says that the local (Hamilton) record is held by VE3AQG, as the first to work W20RI, Lockport, N. Y. VE3DAL is the first Hamilton station to use crystal control on 420. Other VE3s now on 420 include AIB, AXT, DAN, and BQN. W2PSG, Lewiston, N. Y., is also on and working across the lake.

W4HHK, Collierville, Tenn., has a 9903 tripler, and indoor 16-element array, and a crystal-mixer converter ahead of his HFS-183 line-up. He is working crossband with W4BYN in Memphis, who replies on 144 Mc. Paul had a misfortune with his first 9903 that might well serve as a warning to other users of this tube. The 9903 is built with only the glass seals at the top of the envelope supporting the plates. This design results in low output capacitance, making the tube really outstanding for operation on 420 Mc., but it also makes it break *very* easily. The tube will stand normal usage OK, but don't put any strain on those plate pins. Use very flexible ribbon for plate leads, and be careful not to hit the pins in handling.

OES Notes

W3NNV, Colwyn, Pa., would like to know of someone nearby who could help him in getting set up for teletype operation on 144 Mc.

A request in this space for skeds on 6 by W4FLW, Dresden, Tenn., brought results. He is now checking regularly with W4JAG, Princeton, Ky., 75 miles to the northeast.

Phasing the "Twin-Five"—Correction

An error was made in the drawing of the 5-over-5 array on page 56 of the June issue. As shown, the two sections of the array are out of phase. Where the off-center matching is used, the phasing line must be transposed. Additional work is being done on this design, and details will be given in a later issue.



W0ZJB	48	W4FNR	39	W8LBH	39
W0BJV	48	W4IJU	38	W8BFQ	39
W0CJS	48	W4BEN	35	W8LPD	37
W5AJG	48				
W9ZHL	48	W5VY	47	W9ZHB	48
W9OCA	48	W5GNQ	46	W9QUV	48
W6OB	48	W5JTI	44	W9IGE	47
W9INI	48	W5ONS	44	W9PK	47
		W5ML	44	W9VZP	47
W1HDQ	47	W5JLY	43	W9RQM	47
W1CLS	46	W5JME	43	W9ALU	47
W1CGY	46	W5VV	42	W9QKM	46
W1LL	44	W5FAL	41	W9UUA	45
W1KHL	44	W5NHD	41	W9UNS	45
W1HMS	43	W5FSC	41		
W1LSN	42	W5HLD	40	W9GIN	47
W1EIO	41	W5HEZ	38	W9DZM	47
				W9NFM	47
W2RLV	45	W6WNN	48	W9TKX	47
W2BYM	44	W6UXN	47	W9KYF	47
W21DZ	43	W6TMI	45	W9HVW	45
W2AMJ	42	W6IWS	41	W9JOL	44
W2MEU	42	W6OVK	40	W9JHS	43
W2FHJ	41			W9FKD	43
W2GYV	40	W7HEA	47	W9MVG	41
W2QVH	38	W7ERA	47	W9JPI	41
W2ZUW	35	W7BQX	47		
		W7FDJ	46	VE3ANY	42
W3QOU	45	W7DYD	45	VE3AET	35
W3NKM	41	W7JBG	44	VE1QZ	32
W3MQU	39	W7BOC	42	VE1QY	31
W3JVI	38	W7JPA	42	XE1GE	19
W3RUE	37	W7FIV	41		
		W7CAM	40	Calls in bold-face	
W4FBH	46	W7ACD	40	are holders of	
W1EQM	44			special 50-Mc.	
W1QNN	44	W8NSS	46	WAS certificates	
W1FWH	42	W8NQD	45	listed in order of	
W4CPZ	42	W8UZ	43	award numbers.	
W4FLW	42	W8YLS	41	Others are based	
W4MS	40	W8CMS	41	on unverified re-	
W4OCX	40	W8RFW	41	ports.	

Calls in bold-face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.

and W4JL, Rome, Ga., a 265-mile hop to the southeast. During the summer Harry monitors the 50-Mc. band and makes calls at 7 to 7:30 A.M., 11 A.M. to 1 P.M., 5 to 5:30 P.M., and 9:30 to 10 P.M. regularly.

W6CFL, Los Angeles, wonders why it is that superregens for 420 Mc. and up exhibit such variable performance. He has one for 420 that works perfectly, while another that appears to be a duplicate seems to be almost useless. When you get the answer to that one, Tuck, let us know. We've wondered the same thing since our first experience back on 5 in the early '30s!

W8KFC, Hudson, Ohio, reports that activity on 2 in the Akron area is increasing steadily, with at least 6 Novice calls heard regularly. Around Cleveland there is interest in 220, with W8IY, North Olmstead, on 220.7 Mc. and W8JLG, Cleveland, on 220.3. Ralph suggests a buzzer with a quarter-wave antenna as a noise source for receiver adjustments. He has been able to hear the buzzer on a superregenerative receiver for 420 Mc. He and others in the area would like to acquire some R89 ARN5 glide-path receivers; condition not important, so long as the coaxial tank elements are in usable condition.

W9GSY, Selma, Ind., reports considerable increase in number of 2-meter stations. A net operates on 145.86 Mc. each Monday at 8 P.M.

A trouble frequently encountered with crystal-controlled converters is the leaking through of signals on the intermediate frequency. W9KQX, Springfield, Ill., solved this
(Continued on page 110)

**U. S. N. R.****Tennessee Tornado**

A tornado struck Henderson, Tennessee, on the night of March 21–22, 1952. At the request of the ARRL Emergency Coordinator, W4GEH, the Naval Reserve Training Center at Jackson, Tennessee, furnished TCS radio equipment and a gas-driven generator for a radio station at the Henderson County High School. This station served the Red Cross headquarters and the Red Cross emergency hospital which had been established in the high school. A circuit was set up between the high school and the city's central emergency radio station. Operators from the Naval Reserve Training Center and from Naval Reserve Organized Surface Division 6-78 were assisted by W4STB.

Iowa Flood

During the recent flood in the Des Moines and Council Bluffs, Iowa, area, G. F. Binnall, RMNC, USNR, W3RRH/5, traveled approximately 500 miles from Eureka Springs, Arkansas, to assist in the flood emergency. Binnall arrived at the emergency control center at Council Bluffs, Iowa, on Tuesday, April 15, 1952, and brought with him Navy TCS equipment from Naval Reserve Organized Electronics Company 8-6 of Eureka Springs. A former resident of Iowa, W3RRH/5 was welcomed with outstretched arms.

Code Practice

The Naval Reserve master control station at Seattle, Washington, NPD, transmits on the following training schedule, Monday through Thursday of each week:

<i>Pacific Standard Time</i>	<i>Speed</i>
1900–2000	10 w.p.m.
2000–2030	14 w.p.m.
2030–2100	18 w.p.m.

All transmissions are made on 5295 kc. and 434 kc., keyed simultaneously.

Here and There . . .

Chief Radioman George A. Lewis, W5LNV, USNR, of the 8th Naval District Headquarters radio station NDF, has passed the examination for amateur Extra Class license.

Doris L. Nash, RMSN, USNR(W), a member of Organized Surface Division 8-88, Naval Reserve Training Center, Galveston, Texas, recently passed the FCC examination for an amateur license.

N. A. Partridge, W1BWR; Frederick Best, W1BIG; and Zina Corliss, W1RJD, are taking an active part in amateur and reserve activities at the Naval Reserve Training Center, Augusta, Maine.

Philip Roy Kennedy, W9AKP, and Richard M. Mays, W9AJY, are reservists located in the Indianapolis, Indiana, area.

J. R. Yost, W4DNE, is a member of the Charleston Naval Shipyard Radio Club, Charleston, S. C.

Charles P. Robart, Jr., WN2EVL, of Pleasantville, N. J., is now in active service in the Navy.

Lt. Comdr. E. W. Zimmerman, USNR (W4DMP), is now assigned to duty with the Electronics Division of the Bureau of Ships, Washington, D. C.

Richard R. Kerns, ET3, USNR (W5OUZ), is now on active duty.

T. M. McGauley, PHG2, USNR, of the Naval Receiving Station, Washington, D. C., recently passed the FCC examination for a Novice Class amateur license. McGauley is an active member of the Hobby Shop Amateur Radio Club (W3SSW).

**Recap—DX Contest High
Claimed C.W. Scores**

Last month's c.w. scores Preview for the 18th ARRL International DX Competition was incomplete through inadvertent omission of some of the high claimed tallies. We present below a more inclusive tabulation which will convey a clearer picture of *claimed* results. Apparently conditions weren't quite so bad as they were painted! Following are top W/VE totals (station, score, multipliers and contacts):

W5ENE	255,732	202	422	W1AXA	104,895	132	259
W8JIN	237,390	193	410	W3GRF	104,538	131	266
W3BES	228,984	188	406	W6TT	103,752	132	262
W3DHM	220,458	181	406	W6YRA	103,676	133	258
W2WZ	205,740	180	381	W1BFT	95,010	121	270
W4KFC	196,116	177	371	W31YE	96,384	128	251
W8WZ	194,840	180	361	W3KT	94,815	129	245
W3JTC	186,732	171	364	W6FSJ	93,000	124	250
W3LTU	184,212	172	357	VE4RO	92,400	110	282
W4BFD	174,104	164	362	W0AIW	90,678	119	254
W6AM	167,562	174	321	W8DX	90,506	118	256
W9LM	162,771	161	337	VE2WW	88,293	119	249
W8BTI	158,110	155	340	W9DUY	87,750	117	250
W4ESK	156,000	162	321	W4HQN	87,462	129	226
W4BGO	155,925	165	315	W3BVN	86,346	123	234
W6MVQ	150,174	162	310	W8DUS	86,304	124	232
W4BRB	142,749	153	311	W6PYH	85,668	118	242
W4CEN	138,600	150	315	W6WB	85,323	119	239
W3BXE	136,335	149	305	W8ACE	84,870	115	246
W3PDX	134,503	147	305	W2GGL	81,720	120	227
W6NIG	134,505	147	305	W6EPZ	81,396	119	228
W5ZD	127,458	146	291	VE3ZW	80,678	107	252
W1LOP	123,954	146	283	W1TX	74,015	113	219
W3GHS	120,555	141	285	W6PB	73,776	118	212
W6LDJ	119,328	132	302	W4NNH	69,960	108	220
W5CKY	118,854	142	279	W7HXG	69,642	106	219
W1NMP	114,840	132	297	W4KE	69,264	104	237
W6DAE	110,970	135	274	W6RBQ	68,970	110	209
W3FQZ	109,692	132	277	W8CVU	68,364	108	211

High claimed scores outside W/VE:

KV4AA	541,890	90	2015	ZL1MQ	76,200	50	508
KG4AF	518,833	83	2085	DL4EF	71,706	37	651
KH6JJ	331,918	78	1427	ON4QF	69,042	37	622
KH6AEX	275,724	74	1242	G5RI	65,286	39	558
KH6MG	260,570	71	1228	ZE3JP	61,920	43	518
VP7NM	190,033	57	1114	KH6FX	59,643	47	427
CQ2BC	177,954	57	1043	KH6ER	57,684	46	418
KP4KD	169,443	67	843	ZK2AA	57,280	40	481
XE2OKI	131,372	56	789	VP9AL	54,694	41	452
KH6PM	124,551	63	659	OQ5RA	51,356	37	467
KH6DK	110,925	51	725	KP4OD	45,072	36	414
CN8EX	100,754	42	805	E1SC	43,224	24	637
KP4JE	80,370	57	470	VP9OO	35,800	25	478

Other non-W/VE scores over 15,000: KL7WC 33,390, FA9RZ 32,085, GC4L1 31,724, VR2CG 30,293, OZ1W 28,196, DL1DX 28,179, CE4AD 28,117, FF8AG 26,340, OZ4KX 24,544, KL7NXI 23,600, KL7ANJ/KL7 22,968, DL2RO 22,794, HC2OS 20,631, G6GN 18,262, PA9WB 16,874, CT1AL 16,692, OH6NR 16,200, PA9VB 15,900, VK3AHH 15,892, OZ7BG 15,387.

All claimed scores will be subject to checking prior to the announcement of final results.

**SWITCH
TO SAFETY!**



How's DX?

CONDUCTED BY ROD NEWKIRK, * WIVMW (Ex-W9BRD)

How:

Last month we sorta waxed neuralgic and sedimental about DX doings of yore and present. Jeeves thought it proper this month to wrap on his turban, haul out his xtal bal' and give us a peep at a page of "How's DX?" circa 1975. We don't know who's conducting it, but a few paragraphs look interesting. Let's peek over our Swami's shoulder. . . .

. . . **W6SAI**, **HB9AW** and **ON4QF** are off to Neptune with radio gear. . . . QSLs are rumored coming through from **FA81H** and **FM8AD**. . . . **W1FH** now has racked up double-TVDXCC. . . . **W1VMW** has almost licked his **TVI**. . . . **XF1A** and **KV4AA** converted their **W/VE** QSL files to microfilm after their shack floors buckled. . . . **W1DX** needs Jupiter for s.s.b. **WAP**. . . . **W0** is the new prefix for **Arcturus**. . . .

Then the darned thing QSBD. Jeeves wiggled the knobs frantically and DX column paragraphs for a 2002 QST momentarily came into view:

. . . **W6SAI** and **HB9AW** sent **ON4QF** back for another 807 . . . QSLs are rumored coming through from **FA81H** and **FM8AD**. . . . **W1FH** reached the Color-TVDXCC 200-mark. . . . **W1VMW** has almost licked his **TVI**. . . . **XF1A** and **KV4AA** bought more land for their QSL files. . . . **W1DX**'s Jupiter QSL was bounced by **W1RWS**; **Jupiter ink disappears in our atmosphere**. . . . **W4GVU** is now **W4GVU**. . . .

PING-G-G! Excessive crystal current fractured the quartz sphere. Too bad — there was an interesting article in that issue by W1TS on spacecraft mobile rigs and another on synthesized ionospheres by Larson E. Rapp, jr., WNIOW.

What:

Short skip makes twenty sound a little more lively these warm days and the night shift is once again getting in some DX licks. EA9DC, for instance, was doing business with W/VEs almost around the clock, 'phone and c.w., dishing out first ftnl QSOs to a multitude. . . . Another lulu with quite an entourage, ZC2MAC put Cocos Islands QSOs within reach of many while working mainly the low end of 20, c.w. . . . ZS5D (14,020) has a new 75-watter on the air and tells W7PVZ he looks for Ws in the African mornings and evenings. . . . Continuing on the c.w. subject, WN4TVQ became W4TVQ and lost no time in hitting 20; OE13RN, PY3QX and some Europeans were worked first day. . . . VE3BXY made away with OX3s BI (020), UD (100), VPs 6CDI (090), 9HH (050) and CX4CZ (020). . . . Another ex-WN, W2INE knocked off some fast countries on 14 Mc., including OE13HP and KT1OC. . . . W9NN made the grade for WACE and added MI3US, VE8RG, EL2A and ZE4JT to boot. . . . ZB2I (097) answered Chas at W1AW and W2EEY ran into KV4BA (086). . . . W4REZ reports QSLs already on hand from VP1AA, YS1FM, VP7NM, YN4CB, FO8AC, 9S4AX (101) and KW6AR. . . . KZ5WZ raised ZC2-MAC (020) who said he'd be in those islands for some three months. This juicy one runs 35 watts to a long-wire radiator. Wally adds **KC6DX** on Truk (080), 120 watts and a long wire. . . . School work has been hampering W0AIH's

DXing but Paul managed HZ1MY (006), **KW6BB** (042), VR2AS (072), **VS6CK** (065), **VU2EJ** (032), **VK9DB** (055), **YU3AT** (030) and EA9DC. . . . DLAJZ (W2FRE) worked 56 countries out of 85 heard in his first month in Germany. The latest include CE1DC, CX1BZ, EA8BK, FA9IO, FF8AG, FQ8AP, GD2FRV, IS1EHM, KG6ACY, MI3LK, MP4BBD, OD5AM, OQSPE (050), SU5EB (070), SV9WW, TA2EFA, **VU2JV** (025), VSs 1CZ, 6CG (050), VQs 2BM (060), YU1CX (070), ZBs 1BL, 2A (100), ZCs 2MAC, 4RX, 6UNJ, ZD6DU, ZS3K, **4X4BN** (065) and 5A2TP. . . . **HE9LAA** (035), HC8GI, **ZK2AA** (160) and **FD8AB** (027) look good in W5KUJ's log. Charlie's latest QSLs include those of ZD6DU, YI3BZL, ST2GL and EA0AB. . . . **KX6AO** speaks of a 24-hour ragchew roundtable with VQ4BU, VQ4CO and QO5BR — that's the life. . . . W5KUC's West Gulf DX Club **DX Bulletin** pins down this c.w. activity: A.M. — C3MC (036), DU1s GB (100), MB (090), EA9YY (042), FK8AI (069), FO8s AB (082), AG (150), GD3UB (042), KR6s AI (074), HX (060), IG (038), KX6AH (078), KW6AZ (080), OQSRA (008), OE13USA (060), SU1BN (015), VKs 1RG (049-072), 9BI (095), 9GW (037), 9XK (112), VP3VN (018), VQs 4BY (030), 4CM (025), SCB (018), VSs 1BN (056), 1ER (040), 2CY (065), 7GQ (005), 7NG (103), ZP5AY (070); P.M. — CU3YY (!), DU5 1AL (085), 9VL (080), EAs 9BF (095), 9AC (075), EL2R (070), FF8s AE (048), AJ (100), FO8AF (040), FK8s AB (069), AE (046), FK8SBC (028), FQ8s AF (050), AG (016), HC2OM (090), KS6AA (045), WL-DY/KS6 (135), LBs 6XD (021) on Jan Mayen, 9Q (082), LZ1KAB (032), MI3ZX (063), OA4EK (055), OKJAOS (048), TF3MB (047), TG9LC (018), VPs 2GH (083) in the Windwards, 3TY (023), VQ2s GW (060), HC (061), VR1A (074), VS1CO (070), YUs IAD (035), IAS (034), 2AK (070), YV5AK, ZC4XP (050), ZDs 1SS (007 tbc), 2HAB (070), 9AA (032), ZS3HX (070), 5A2s TL (072) and TS (030).

On twenty 'phone, XE1AC pounced on EA9DC like DDT on a taterbug. Al added KB6AO (14,257), VQ4UB (167), ZK2AA (308) and EA8AC (123). . . . YA3UU (095), LZ1KSR (200), MIB (160), ISUF (230) and 4UAJ (200) helped fatten GAZU's roster. . . . ZP4s AF (175) and BB (195) are highly recommended by W0AIH. . . . School restricts W4REZ to week-end DXing but he did well with FG7XA, HRs 1KS, 2JM, YN1WC and HI6EC.



* DX Editor, QST.



Jimmy Taylor, GM2DBX, has accomplished 'phone DXCC with this layout in Fife. GM2DBX is a pharmacist by trade.

W4GXB reports WSSGH/FKS raising havoc for a week or so. He and W5MPG were among the early birds to catch EA9DC on voice. The DX Bulletin and W5KUC/UCQ account for the A3 activities of CSJAC (310), DUs 1AL (201), 1JI (147), IVVS (182), 7SV (238), 9VL (153), EAs 8BC (120), 9AR (305), FQ8AK (100), GD3s GBG (315), US (220), HC8MM (120-398), HI6TC (280), HH3L (140), HZ1MY (155), W0EGY/KJ6 (272), W6HKH/KM6 (230), KM6AY (250), KG6DX (210), KW6s BD (230), CB (250), MI3DW (324), MP4KAC (180), ODSAB (300), SP0KAA (110), ST2GL (250), Tas 2FEA (170), JAA (315), VK0DB (150), VR2CG (312), VR1s A (065), B (130), VSs IAJ (257), 1DS (128), IES (304), IA2 (337), 2BS (170), 2CY (136), 6BA (145), 7FG (147), VU2s ARCI (155), ET (324), XX2s KN (307), SS (270), ST (302), YU3AC (190), ZK1BC (308), ZE3JY (275), ZS2MI (137), 3V8BB (318) in the a.m.; CNs 2AD (337), SEI (304), 8FF (337), SGD (320), CRs 4AC (175), 9AH, CPIAM (155), DU6IV (152), EA8 SAP (342), 8AZ (175), 9AA (306), EL9A (345), FB8BE (100), FF8CN (350), FQ8AI (135), EB2WF (200), HK1DZ (310), IT1s BNH (203), BXX (187), KV4BF (295), MF2AA (320), MI3s RC (310), RR (192), US (070), ODSAC (320), OE1s SC (285), USA (313), OQ5s CF (105), PE (045), VP (215), WW (145), FT3SG (150), VK9YT (330), VPs 2GX (165), 2LE (335), 3LR (176), VQ2DC (145), 3CH (335), 3CR (135), 4AA (160), 4AC (100), 4AQ (180), 4BU (167), 4CO (135), 5AU (156), 5BVF (100), SDO (120), 8CB (319), VR2AP (170), YI3BZL (330), YU3AC (190), ZB1GKU (177), ZC6UNJ (305), ZPs 2BB (125), 2DD (105), 4AK (125), 5A2TO (323) in the evenings. Note how the UV2s have slipped out of the picture this month.

We find that Uruguay's amateurs have had fifteen available since 1949. Australian hams can now use the band and overseas U. S. military personnel may be in positions to add more countries to 21-Mc. activity. MI3s and 5A2s are among this group and are especially on the lookout for Ws. KZ5WZ says W6AM is the loudest 15-meter signal down his way. Wally has been hooking stuff like KC6QY, CE3AX, VP6CDI, CM9AA, KV3AA, HP1AW, VK4s HR, SN, ZB, PYs 1ADA, 2HT and KH6YL. Europeans were active but their chief path was to South America.

Forty is still worth a try. OY2Z (7005) told W3RFA theirs was the first W-OY 7-Mc. contact. OY2Z uses 30 watts, a dipole and a 4-tube superhet. Chas of WIAW hopped on VP8AJ (015) and W2EEY raised KG6FAA (023) who is plenty fast with a pasteboard. G3IAD and PA9RC were W2LSJ's first DX QSOs. W2NII collected HZ1MY (025) and heard ODSAB (025) who is ex-AR8AB. YU1s 1AND, ICX, HKs 1GE, 4DP, 5CR, KG4AO, CT3AB, YS1O, ZS3P and sundry PYs were

gathered by W9ESQ. Lou had to work nine HHs on 40 before one (HH2CL) came through with a QSL. W8YGR has no better luck with HH cards although ELs and 7A came through promptly. Jack garnered VP2SC (090) in the Windwards. VP5BH (001) in the Caymans, YV6AO (072) who likes to switch to 'phone, VP6FM (001) and TI2PZ were buttonholed by W4REZ.

Alaskan Novice WL7AOC's 70-watter raised ZL1ADU (3710) for some unusual work on eighty. WN4USQ worked VP7NT (3750) c.w.-to-phone and states that the DX bug really has him cornered. Six WH6s have been worked at WL7AOC. These Novices are really beginning to get around on 80! W4REZ found 'phones HI1BG (3792) and VP5BP available on seventy-five.

A 2E24 at 28 watts does well for W6NZX on ten 'phone. Bob mailed KX6AO, KJ6AR, HP1HO, HC1KV, ZL2CC, PJ5ZO, CX7BA, ZS8s 1JZ, 6DW, VP6CJ and VR4HD. A 3-element close-spaced beam was probably responsible for KZ5WZ scared up VP2GX (ex-VP2AC) on voice while a c.w. CQ surprised W4REZ by raising PJ5NH.

Nothing much cooking on one-sixty this time of year but the dust is still settling after last season's efforts. W1BB reports that W1LYV has received SWL cards from Czechoslovakia and Russia. The OK listener's report concerned '52 activity while the U.S.S.R. card pertained to January, 1951, operation.

Where:

W9YXO desires it emphasized that he does *not* handle QSL matters for ZK2AA. We printed info to the contrary over a year ago and Ken still gets requests for QSP. So far as we know, the *Call Book* address for ZK2AA is perfectly okay. Bear in mind the 4X4 QSL bureau has instructions that all ZC6 operation is illegal and therefore will not handle cards for stations bearing that prefix.

CN8FF	Sgt. L. W. Geldner, Hq. 5th Air Div., Box 11, APO 118, % Postmaster, New York, N. Y.
DL4JZ	PFC R. Friederich, 97th Sig. Opn. Bn. Radio Co., APO 46, % Postmaster, New York, N. Y.
EA9DC	(QSL to EA8AW)
EL2A	Ed Yarborough, Firestone Plantations Co., Harbel, Liberia
FB8BE	Box 86, Tamatave, Madagascar
FB8ZZ	(QSL via FB8BS or 9FLQ)
FF8AJ	Yves Bijault, Box 230, Bannak, F. W. A. M/Sgt. Don E. Kitchen, AF-6789509, 71 Clarke Ave., Langley Air Force Base, Va.
ex-JA2DK	Art R. Fillebrown, Pago Pago, American Samoa
KS6AA	Gordon T. Henderson, KL7AOS, Shuyak Island, % CAA, Kodiak, Alaska
ex-KZ5GT	R. Reimund, Field Stn. 8604-AAJ, APO 843, % Postmaster, New York, N. Y.
MI3RR	



In the patio adjacent to PY2CK's shack are Mrs. W1ZD; John M. Wells, W1ZD; Capt. Fowler, a companion; PY2CK; and Mrs. PY2CK. The W1ZDs were visiting in Brazil and decided to pay a visit to one of the world's ace 'phone DXers.

OA4V Inter-American Geodetic Survey, % U. S. Embassy, Lima, Peru
 OD5AJ Elias M. Raouf, P. O. Box 352, Tripoli, Lebanon
 OY2Z Johan Ziska, Box 71, Torshavn, Faeroes Islands
 SV0WW Skip Gross, USASG, APO 206, % Postmaster, New York, N. Y.
 ex-VE8RY John W. Smith, VE3DCQ, Box 538, Wingham, Ontario, Canada
 VP2MD Cyril Volneny, Monserrat, Leeward Islands, B.W.I.
 VS7RSC Radio Society of Ceylon, Box 907, Colombo, Ceylon
 W2AOS/KG6 ex-W3ENK (QSL via W3KT)
 YA3UU (QSL via RSGB)
 ZC2MAC (QSL via RSGB)
 ZC6UNJ UN Mil. Obs. Gp., APO 206-B, % Postmaster, New York, N. Y.
 ZD4BF J. R. S. Innes, Box 7, Takoradi, Gold Coast
 ZE5JA C. Jordaan, P. O. Box 17, Bindura, Southern Rhodesia
 ZS3U W. V. Helsingdon, P. O. Box 49, Gobabis, South West Africa
 3A2AM Marcel Ardisson, 28 rue Grimaldi, Principality of Monaco
 4UD UN Radio, Jammu, Kashmir, India
 5A2TV Box 66, Tripoli, Tripolitania, Libya

W1s FTX IKE ODW RWS, W2e TXB ZQW, W3RFAs, W5s EGK KUJ, W8SYC, W9CFT, W0AIH, OVSV's OEM and USKA's *Old Man* take credit for our roster this issue.

Tidbits:

ZC6UNJ is located in a "No Man's Land" between Israeli and Jordanian outposts. Operator W5LLQ has at his disposal a Temco-600 rig running 150 watts, an NC-240D receiver and folded dipoles. He reports regular reception of U. S. mobiles on 20 'phone' VE3CJ, taking another crack at an ARRL DX Test as VP5BP in the Caymans, was assisted ably by VE3HC. A 1-kw. generator powered a 32V2-75A combination which managed a total of 924 contacts with 775 stations; 731 QSOs were on 20 meters, 116 on 10 and 77 on 75 — all QSOs 'phone'. VE3DGZ was the only station worked on all three bands. VP5s EM and FR provided the Ontario boys unlimited hospitality in traditional ham fashion Notes re Lebanon, courtesy WIKE: Their government has informed ITU that amateur operation is now recognized as legal; however, proper notification must go through appropriate channels before Ws are permitted to resume communication with Lebanese stations. By the way, amateurs in Lebanon now use the OD5 label in lieu of AR8. Exams there are held twice yearly and license fees are approximately thirteen bucks. Operation on 14, 21, 28, 144 and 420 Mc. is permitted. Setting up of a QSL bureau is pending upon the formation of a responsible national radio society W3PYH and KV4B are separately contemplating possible rare-DX operating excursions Some of the DL gang, nationals and DL4s alike, have formed an amateur radio club which looks forward to close cooperation with IARU, ARRL and DARC. DL4GI was elected president, DL3DC vice-president and DL4EA secretary. An excellent spirit of cooperation between American and German amateurs is evident W3ENK closed down his station at Silver Spring, Md., on January 31st and since April 9th has been active as W3ENK/KG6 with 75 watts on 14 and 7 Mc., c.w. He intends to add 10- and 20-meter 'phone' to his repertoire and assures 100-percent QSL. Charles has also held the calls W2AOS and KZ5CB. "Haven't missed [sending] a QSL in 32 years!" W4BRB offered to hire Jeeves if, in addition to his regular duties, he'd keep an eye on W2QHH and fill in at center field on Gene's ball team. (How about my playing fourth base, Boss? I'm always catching it, anyway. — *Jeeves*) QSLs for 984AX mailed to W1NWO



The entire ham population of the Caymans is gathered here. From the left: D. Tibbetts, VP5BD; H. M. Coe, VP5BE; Noel B. Eaton, VP5BP (VE3CJ); and A. H. Hanlan, VP5BH. This Cayman quartet assembled during VE3CJ's operational excursion to the islands for the '52 ARRL DX Test.

will be acknowledged but the 984 does not verify QSOs unless and until cards are received. 984AX finds this policy expedient in view of the fact that his W QSOs now number into the thousands ON4NC, who still needs Nevada for WAS, would like to know of a way to procure ET3AF, VO2G, VO4L, EQ1RX, EQ2L, VQ8WU and W4FVI/KX6 QSLs, these stations worked in the period '46 through '49 From KH6WW we hear that KC6QY (ex-KH6QY and KH6QY/KC6) is putting together a 1000-watt for operation on 80, 40 and 20 meters. On 40 he uses a ground-plane skyhook built around a big bamboo pole KH6AFS amazes locals with a QRP pipeline into Europe on 7 Mc. Invisible rhombics? Ex-W2MVP is now K2CW, a fact we couldn't seem to get straight in a recent column Three guys currently on Macquarie Island are VK1RG (VK5RG), VK1EM and VK1RR. Ex-VK1BS is now VK2EG and says he has received but 128 QSLs from over 400 Ws worked at VK1BS. Bill worked 40 United States and 75 countries and will round out his QSLing 100 per cent. He writes further, "I would advise anyone contacting a VK1 amateur to send the card to the bureau or to a QTH given by the station. Do not send them to the island if . . . not sure as to the mail facilities or mail closing dates. . . . Reception is very poor on both islands owing to the high absorption down there." W6NMIC is to journey around the world on a freighter and will take along a rig and receiver for possible work on all bands 80 through 10 meters. W6AM says he may get a shot at CR8, FN8 and FL8 operation Along with a big batch of eagerly awaited QSLs, ZM6AK sends word that he's about to fire up his prewar rig at ZL1FT. "Don't think there will be much, if any, ZM6 activity now as ZM6AA and I were the only ones who took QSL seriously." HE9RDX, DX editor of USKA's *Old Man*, writes that all cards received for 3A2AD operation have now been answered. His records indicate that over 400 stations worked did not bother to QSL — the demand for 3A2 must be in good part satisfied! Etienne would like to take a fling at HV work but the possibility at present seems remote ON4QF told me all about his [new] projected expedition, but I swore not to tell," writes Bob Schoening. A plague on all Ws ending

(Continued on page 128)



It looks as though a big wave could sweep KW6AR's shack right off Wake Island into the Pacific. Ivan has one of the biggest signals to come out of this part of Oceania.



Hints and Kinks For the Experimenter



SIMPLE CODE-PRACTICE AID

THE gadget shown in Fig. 1 is a simple means for using any receiver equipped with a b.f.o. as a code-practice "oscillator." Simply plug P_1 into the 'phone jack on the receiver, a key into J_2 , and the 'phones into J_1 . Close the key and tune in a steady signal, such as WWV or the carrier of a broadcast station. Open the key and the 'phones go dead, close it and the signal comes through again. From here on, use the unit as you would any oscillator.

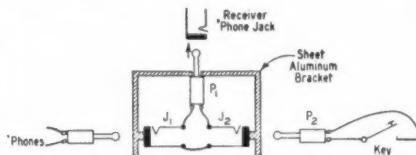


Fig. 1 — Here's the way one Novice solved the problem of obtaining a code-practice oscillator. J_1 and J_2 are open-circuit 'phone jacks, and P_1 and P_2 are ordinary 'phone plugs.

The two jacks and the plug are mounted on a small bracket made of sheet aluminum. The two jacks must be insulated from the bracket. The entire gadget cost me only 95 cents, and was well worth the time it takes to build. — George B. Jeffrey, WN9OXH

CONVENIENT ENTRY "BUSHING" FOR TWIN-LEAD

A ONE-INCH diameter cork can be used to make a weather-tight bushing for the hole through which Twin-Lead enters the shack. Cut a slot deep enough to permit the Twin-Lead to be sandwiched in the cork. Then drill a hole a little smaller than the diameter of the cork. Push the cork in the hole, and it will squeeze the Twin-Lead tightly, holding it securely in place. At the same time the cork successfully plugs the "leak" in your window or wall to keep out the weather. — K. F. Triggs

ANOTHER CRYSTAL-GRINDING HINT

PREVIOUS attempts to change the frequency of a crystal frequently resulted in diminished activity or complete failure to oscillate. The probable cause was that the grinding surface was not perfectly flat. Much of the so-called plate glass does not have a truly flat surface. As an excellent substitute the good old-fashioned razor hone was pressed into service, and since then results have been far better.

When rapid cutting is desired, grinding compound may be used with water in the usual manner. Putting the grinding compound in an old

salt shaker and using a medicine dropper to add water when needed cuts down on the messiness of the operation. For finishing, the hone is used alone with plain water for slower cutting.

The hone used here is of the hard-surfaced type, and measures 3 by $5\frac{1}{2}$ inches. Figure eight strokes utilizing as much of the surface as possible were used. Approximately 500 such strokes moved an 80-meter crystal about 125 kc., depending on the pressure exerted. It is wise, of course, to check results frequently so that you don't overshoot your goal. — Harry H. Heinrich, W9KPG

SAFETY INTERLOCK FOR CABINET RACKS

THE sketch shown in Fig. 2 is a simple, inexpensive method of making it impossible (or at least difficult) to open a cabinet rack without killing the power first. Terminate all transmitter a.c. supply leads at a male chassis connector in the side of the rack near the back, as shown.

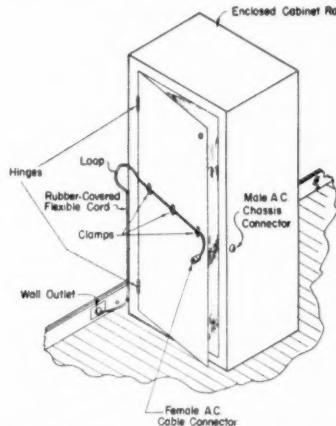


Fig. 2 — Here's an inexpensive interlock system devised by W2PJF.

Feed this connector with a convenient length of heavy rubber-covered cord clamped across the door, with a female connector on the end of the cord. Leave only enough excess cord here to make the connection when the door is closed. The rest of the cord should be clamped down the hinged corner of the cabinet, leaving a small loop at the turn so that the door can be operated without undue flexing of the cable. It will then be impossible to open the door without first unplugging the power cord. — R. M. Girdler, W2PFFJ



Correspondence From Members-

The Publishers of *QST* assume no responsibility for statements made herein by correspondents.

MOBILE

822 West 22 St.
Kearney, Nebr.

Editor, *QST*:

Mobile operation is increasing by leaps and bounds. Pending specific legislation, why don't all of us become "mobile helpers" by not ruthlessly invading, with our fixed stations of much higher power, those frequencies near the band edges of our 'phone bands. If we allowed 10 kc. for mobiles at each end of the 75- and 20-meter bands it would serve two purposes. First, hundreds of mobile operators would be perfectly happy. Second, FCC notices for out-of-band operation by fixed stations would be a rarity.

— *Glen H. Byars, W6BNF*

much better performance will be obtained if a fixed grafted is installed here. The center smok should be grounded. As for the room, let it float! Much greater sensitivity and improved limiting action can be obtained by using the new improved 1Z2Z in place of the present used 1N2N. There is a 1C2C on the market at a higher price but the difference in performance does not merit the added cost. If it's a choice between the 1Z2Z and the 1C2C I would pick the 1Z2Z every time over the 1C2C. Why? Gentlemen, it's easier to pronounce!

— *John F. Cleary, W8VSP*

HOW TO BECOME . . .

226 Clifton Avenue
Staten Island 5, N. Y.

Editor, *QST*:

Every now and then you'll read an advertisement in *QST* of a fellow requesting aid from experienced amateurs to help him with theory and the code. Also, during the past six months since I became a ham operator, I have met several persons who desired to be amateurs but gave up because, as they told me, they couldn't get anyone to assist them. Brother, let me tell you something; you don't need any help if you really want to join this great hobby.

I am a middle-aged man with a family and, until a little over a year ago, all I knew about radio was to turn on and off a broadcast receiver. To show you my ignorance of electronics, the first time I looked inside of a receiver I wondered why they used prongs on a tube instead of screwing it in place like a light bulb.

Today I hold both the Novice and Technician tickets and a first-class commercial 'phone ticket. The first day of my vacation I'll be at the FCC office to take the test for the General Class ticket. I feel confident of passing the test because more than a month ago I received my 15-w.p.m. endorsement sticker from the ARRL.

Here is how to do it. Read the *Handbook* over and over again until you fully understand it. Read it every chance you have, while eating your lunch and riding to work. I must have read each chapter in the *Handbook* at least a dozen times. The code I must admit was tough for a while. I did get some assistance there from W1AW each night at 9:30 EST but you can get that too. Copy, copy, and copy everything you hear over the air but never more than for an hour at a time. It took me six months because my skull is a little thick in places but you may do it in half the time. No sir; you don't need help from a licensed amateur if you really wish to become a ham operator and join the greatest gang in the world. I did it and so can you. By the way, I wonder what this u.h.f. is all about.

— *Frederick H. Scheuter, W2IPA*

MOTORCYCLE RIGS NEEDED

811 S. Union Ave.
Los Angeles, Calif.

Editor, *QST*:

Civil defense seems to be a popular subject nowadays. Yet the ARRL, which should know better, seems to have neglected publicizing the most important mobile asset of civil defense units — radio-equipped motorcycles.

Motorcycles can navigate rough, rugged mountain country, can cross streams, get over bare silvers of ruined bridges, and go 70 miles on a gallon of gas. Long after autos have been arrested by bogged roads, the cycles will continue to travel, to observe and inform.

How in the world did such a valuable piece of gear get pushed into the background?

Yet, motorcycle radio has problems peculiar to itself which should be discussed in the pages of *QST*. Let's get hot on it!

— *Lee Lamascus, W6JQP*

(Continued on page 150)

RAPPORT

42 Parkwood Dr.
E. Syracuse, N. Y.

Editor, *QST*:

In reference to Larson E. Rapp's perspicuous article in April *QST*, I would like to offer several suggestions toward improvement of the over-all system.

In recent experiments I made numerous changes in the transmitter design but any improvement over the original was to no avail. Mr. Rapp, bless his soul, has touched greatness. I seriously doubt if anyone will overshadow his basic circuits.

As to the suggestions: The receiver adapter circuit is of sound design but I did make minor changes in components. It is not necessary to use a linear taper control for *Rs* —



Operating News



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JOHN E. CANN, WIRWS, Asst. Comm. Mgr., C.W.
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L. G. McCOY, WIICP, Asst. Comm. Mgr., Phone
LILLIAN M. SALTER, Administrative Aide

Loose Talk and Security. Though some contacts are crosstown, it is well to remember that signals on some frequencies go many thousands of miles when conditions are favorable. Propriety rightly keeps many of our intimate, personal, club, and argumentative matters off the air and in the club and organization meetings where they properly belong. Our amateur sense of responsibility similarly is more important than specific rules of what can and cannot be said. From the national security standpoint, whether key or mike is used, it is important that amateurs avoid discussing any matters that might provide missing information in the picture puzzle which the intelligence services of unfriendly nations are continually working over, to ascertain the state of our national morale, and the state of civilian and military defense preparedness. FCC and ARRL place high reliance in your discretion and cooperation in such matters. Let there be no loose talk. Keeping on the subject of *our own radio technique* is a safe course. The following seven Operating Precautions reprinted from an earlier *QST* may serve as a rough guide when operating:

- 1) Sign each transmission with your assigned call.
- 2) Do not permit unlicensed operators to use equipment.
- 3) Contact no unlicensed stations.
- 4) Follow each FCC regulation with scrupulous care.
- 5) Do not discuss any happenings that might have military intelligence or political significance.
- 6) Limit on-the-air discussions to radio technique and personal matters.
- 7) Watch for any possible signs of radio activity that do not belong in our bands, strange or subversive or suspicious. Report all such to the Field Engineering and Monitoring Division of the FCC without delay for any necessary study or investigation.

Note that last point especially. We must spare no efforts to keep our amateur radio *clean*. Perhaps you read with some pride those recent *Satevpost* articles covering FCC monitoring of radio as illegally employed by gambling and race-track enterprises, and where amateur know-how was the helpful key to the tip off and successful execution of duty by FCC officers. FCC is cultivating the reputation monitoringwise of always getting its man! It has the tools to work with and law on its side. Should any amateur operator, through approach or tuning the different frequencies run across the track of bookies, gamblers or racketeers generally, and especially those subversive possibilities named in point seven, report the facts appropriately and quietly to the FBI or FCC for instructions, or investigation by them as case may seem to warrant.

On Informative CQs. W6LDJ writes to suggest more use of additional types of informative CQs. Let us record his ideas and ask all of you who feel a need in these directions to give them a try.

<i>Call</i>	<i>To Indicate</i>
CQ RC	Station calling desires ragchew; answer only if so inclined.
CQ T	Station calling desires to test or experiment, does not want to ragchew. Answer only if so inclined.
CQ QRK	Station calling desires a series of QRK reports at various points; answer only if you don't object to short quick signal report exchanges.

"The above is now sometimes accomplished in amateur 'phone work by calling 'CQ for a short check' which may indicate the need for such procedures. Example, one finishes a portable rig wants some checks on the keying or signal strength at a few points — not a long harangue about the weather, handle, etc., which a simple CQ call might bring. Nothing against ragchewing, of course, great in its place when both parties are agreeable."

A Nine-Point Self-Rating System. There's always high interest in self-rating systems. One applicable to the division of operator activity in *amateur radio* will be something for you to try on at the same time we add 'em up! This list was devised by the St. Paul Radio Club and published in its bulletin the *Ground Wave* to help the SPRC members, then putting the new call letter plates on their cars, to devise ready answers about the why of their license plates, against those who will allege political privilege. The *Ground Wave's* suggestion is applicable to each and every amateur. This is that all amateurs run through a nine-point consideration of how we stand in justifying our amateur authorizations, at the same time we enjoy our hobby. The SPRC credits toward a possible 100%: (1) home stations in operating condition, 30%; (2) mobile operation, 20%; (3) emergency-portable equipment, 20%; 5% each for (4) amateur Radio Emergency Corps membership, (5) emergency power supplies, (6) traffic handling and nets, (7) cooperation with civil defense, (8) cooperation with Red Cross, (9) active club training program.

If one's score is less than 70% we suggest the list be used as a start on widening amateur activities during the coming year. Amateurs with whom we have discussed the list would emphasize that it isn't just *having equipment* so much that makes for communications performance, as it is the actual *active participation* in nets and AREC.

On Using Break-In. Break-in should be a "good operating habit." If using 'phone we may want to call it "push to talk." Whether for 'phone or c.w. every constructor should consider building the *capabilities* for full break-in into his station. The traffic man is most often accustomed to using break-in as part of his standard high-grade procedure. W9LQE finds that the rag-chewer could profitably use the same technique to make more pleasant and effective QSOs possible and he writes to that effect.

The operating technique of using break-in is simple. In traffic handling, we break by sending BK, or a series of dashes or a series of dits. When the station being broken stops sending, we know he has heard us breaking, and that we can go ahead with the last word received correctly. C.w. break-in, if working properly, can be used exactly like talking on a telephone, where one person can interrupt the other at will. W9LQE suggests the operator *being broken* acknowledge with a "BK," pausing to receive any advice on receiving conditions or rate of speed, since adverse conditions may make new instructions to the transmitting operator, by the receiving operator, necessary.

Frequency Observance Important. In recent months reports from several ARRL Official Observers have indicated a possible ignorance or disregard for frequency band limits! The 20-meter 'phone is mentioned most often in observer reports in that connection. Confirming checks made from W1AW disclosed some W-stations with carriers 5 to 35 kc. beyond the 14.2 and 14.3-Mc. points, for example. Of course we amateurs should constantly remember that the individual reputation as well as that of the fraternity for clean operating depends on *close adherence to frequency authorizations*. FCC monitoring stations are on the job enforcing the rules.

Drifting v.f.o. trouble, some lack of appreciation of the problem may be mixed in with some intentional disregard for the sub-band edge. WØTKX offers some thoughts about the recent dubious frequency observance:

Violators range from fellows who zero beat *everyone* they call from force of habit to hard-shelled oldtimers risking a pink ticket to get through the QRM. A W5 was heard remarking toward the end of a round-table with VEs, "Well, I had better not hold it too long, since I am outside the band here." Some 10-meter hams suddenly presented with Advanced Class licenses find the 14-Mc. band too restricted for their "loose" VFOs? Perhaps those "tolerance" questions in the Advanced examination were just figures and formulae to be memorized without conveying a meaning, or too quickly forgotten? An amateur *mobile* heard on 14.193 was working with a fixed amateur station on this frequency. The latter must have set his frequency without looking at either transmitter or receiver dials. A W2 was logged two days in succession just outside the high end chatting with South African stations. . . .

Quite a few amateurs may be right on the verge of being caught up with the inevitable FCC Monitoring Notice! With all that has appeared on the stabilization of oscillators, calibration methods, etc., reference to the *Handbook* and running *QST* file will give a wealth of information on the evaluation of drift and equipment precautions to be observed. . . .

OOS only send Cooperative Notices to invite an amateur to look into his own situation and

responsibility to help him avoid FCC trouble. Such information is for investigation and evaluation, not for purposes of rightness or arguments. The dangers of indiscriminate zero beating, the values (magnitude and direction) of warm-up drift, stand-by drift and frequency changes during high and low power operation, the similar drift in receivers and standards (too few hams make these a part of their stations) should be known and considered by all. The limitations of crystals themselves depending on temperature, holder and circuit capacity and other conditions are things with which every amateur should be familiar. This is an *individual* responsibility between each amateur and FCC in the final analysis. A system of check-back against WWV is our final word of advice, or else lacking such provisions, we personally should not flirt with the band edges.

—F.E.H.



This certificate has been awarded for the year 1952 to each of the clubs listed in the ARRL Affiliated Club Honor Roll that appeared on page 64 of June *QST*. Issuance was based on membership information obtained from the 1952 Annual Club Information Survey. There will be an additional *QST* Honor Roll published later this year to include those clubs reporting results of ARRL membership drives being conducted currently. Clubs that qualify for the second 1952 listing will also receive 100% certificates following publication of the Honor Roll.

A.R.R.L. ACTIVITIES CALENDAR

- July 12th: CP Qualifying Run — W60WP
- July 18th: CP Qualifying Run — W1AW
- July 19th-20th: CD QSO Party (c.w.)
- July 26th-27th: CD QSO Party ('phone)
- Aug. 3rd: CP Qualifying Run — W60WP
- Aug. 18th: CP Qualifying Run — W1AW
- Sept. 5th: CP Qualifying Run — W60WP
- Sept. 10th: Frequency Measuring Test
- Sept. 16th: CP Qualifying Run — W1AW
- Sept. 20th-21st: V.H.F. Contest
- Oct. 4th: CP Qualifying Run — W60WP
- Oct. 11th: Simulated Emergency Test
- Oct. 15th: CP Qualifying Run — W1AW
- Oct. 18th: CD QSO Party (c.w.)
- Oct. 25th: CD QSO Party ('phone)
- Nov. 9th: CP Qualifying Run — W60WP
- Nov. 13th: CP Qualifying Run — W1AW
- Nov. 15th-16th, 22nd-23rd: Sweepstakes Contests



The lessons learned by amateurs participating in emergency communications are of little value to the fraternity as a whole if they are not publicized. There has never yet (and probably never will be) an emergency in which all AREC operation was so perfect that no implied vows were made concerning improvement "next time." Lessons coming out of recent emergencies will be noted in this column from time to time as a sort of "Hints and Kinks for Emergency Operation," so that progressive local AREC units will have the opportunity to learn through the experiences of others. Here are a few:

1) Operating conditions during or after an emergency are generally anything but favorable, and it is necessary to operate emergency setups with as high power as is obtainable, especially when using 'phone.

2) Noise limiters and clippers on receivers are a definite asset, in addition to hash filters on your own emergency power source. Noise from generators being used for lighting and other non-communications purposes can be a great drawback unless your own receiving equipment makes provision for suppression of such noises.

3) A pre-prepared antenna on a suitable reel should be kept available for emergency use, since it requires time to cut, erect and load up an antenna in a disaster situation; along with your portable rig, you should have a portable antenna.

4) Our business in an emergency should be to handle the communications which agencies being served require us to handle; nothing else. However, in exceptional cases it may be necessary for an AREC official to decide which type of message shall receive priority handling. In this connection, we have to divide message traffic into two categories, as to whether they pertain to (a) the general public welfare or (b) the welfare of an individual. Concerning the former, we have to decide which require immediate action, which have a time limit for delivery and action, and which are of a non-urgent nature. Concerning the latter, it should be obvious that outgoing messages containing assurances of safety or notification of death or injury should receive priority over incoming traffic of a "worry" or "agony" nature. In the final analysis, each emergency has its own peculiar ramifications. We amateurs should avoid having to designate priorities on messages we are given to handle; if we cannot do so, the above may serve as a general guide.

5) Perhaps the greatest lesson learned in all emergencies is the necessity for more preparedness and official contact as a corollary to emergency planning. Most of the difficulty in setting up facilities and getting these facilities used and trusted by agencies needing them is directly traceable to lack of previous contact with or knowledge about them on the part of officials concerned. We should make sure that the things about an emergency situation that irk us communicators are not basically our own fault.

A large area of the City of Swift Current, Sask., was threatened by flood waters in April from the Swift Current

Creek. Radio contact had been established between the dam at Duncairn and Swift Current by army units, but this contact was interrupted and amateurs were asked to establish contact immediately. We were alerted at 2130 and at 2200 were told to proceed. A spare 100-watt transmitter from VE5JG, powered by a 1500-watt lighting plant, left Swift Current after midnight with VE5BQ and was on the air and in contact with base station VE5JG at 0230. An hourly schedule was arranged. The local Department of Transport range station arranged to monitor the emergency transmitter frequency continuously, so we did not have to keep a continuous watch at the base station. VE5BO was alternate base station. VE5FP loaned his 50-watt transmitter as a standby at the dam. VE5OH relieved operators at VE5BQ while VE5AZ assisted at VE5JG. VE5BQ never missed one schedule from the time of its arrival at 0230 April 21st to 1045 April 23rd. Signals from VE5BQ were reported from the West Coast to Winnipeg, operating on 3770 kc. Wonderful cooperation was extended by all hams in keeping our channel clear, offering equipment and personnel for our assistance, and also maintaining a watch on the frequency.

— *VE5JG, EC Swift Current, Sask.*

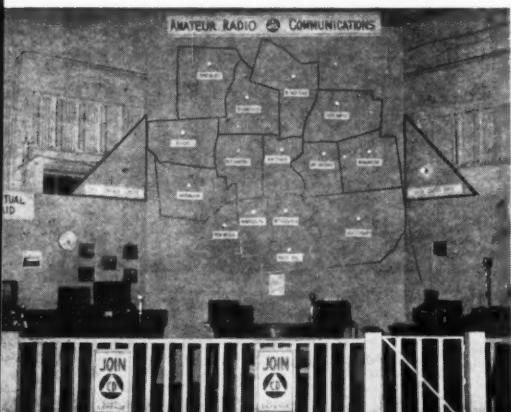
On the morning of May 11th a tornado hit the little town of Alapaha, in southern Georgia, destroying about 75 per cent of the town. All power and communications were out and the water supply was cut off. W4PFF at Dublin was first to learn of the disaster and call in on the frequency of the Georgia Cracker Emergency Net (3995 kc.) to contact W4LXE, net manager. W4LXE alerted the net and sent two mobile units, W4ACH and W4OIL, to Alapaha. When the mobile units arrived they found the city without communications. City officials used the mobiles and the net to contact the Red Cross office in Atlanta, requesting a water wagon, tents, cots, blankets and food. This was delivered to the American Red Cross in Atlanta and the answer was returned to our mobile units in Alapaha advising that the equipment was on the way. Our mobile units stayed in Alapaha until the telephone circuit was completed and their services were no longer needed.

Stations participating in this emergency were: W4ACH BIW FBH IAO IFQ KLJ LXE MZO OIL OTD PFF PGK PKT PYM (W4NS at the mike) SCR and ZD. The Red Cross Director praised the hams for the fine job they did in handling traffic for him and keeping him informed.

— *W4ZD, SCM Georgia*

On November 4, 1951, Rhode Island conducted the first statewide CD test in its history. Incidents prepared beforehand lent color and realism to the drill. Certain areas surrounding Providence were serviced by 10-meter mobile units: W1S KKE LZY OOX PTF RAM RVG SGA and SIK. W1MJ handled the control mike for the mobile networks. W1HEH also assisted. The traffic handled by these amateurs sent hundreds of firefighting trucks, ambulances and police into the fight. Numbers assigned to each car greatly speeded up the action. W1NFM was "Control." Frequent use of proper procedure within the time limits required prevented any confusion. Announcements to the effect that the messages were "simulated" were made with each message from the control station.

A 2-meter network was also in operation, embracing all the larger towns surrounding Providence and using equipment furnished by the State. W1S AFO CPV JND JP LCP



The AREC groups of the Greater Hartford (Conn.) area got together in a cooperative project to establish this Amateur Radio Civil Defense center at the Alert America exhibit held in the West Hartford Armory in early March. Contact was maintained with control stations in each of the towns in the 15-town mutual aid area, as well as with the many mobile units in operation in the area. A small amount of traffic was also originated. Most operation was on 10-meter 'phone and 80-meter c.w.

QST for

MCP OJE PAZ and SKT participated, with BGM at the control mike.

The 75-meter band took care of our long-haul traffic in compliance with the Ten-State Mutual Aid Plan. Although actual aid was not requested from the other states over the air, informational messages were transmitted to the two adjacent states. This network included W1s BBN BVY CPI JJZ JRZ KMV OIL OUR PVY SBP and TJR.

WJFF, EC of Newport and his crew did a wonderful job at working two, ten and seventy-five. The Newport and Middletown networks were credited with being the first to flash the news of a Navy jet crash into a Newport home. Aiding WJFF were W1s MMX, PXI, W4PAE/1 and WN1s TXE and TXL.

Firefighting apparatus from other states also participated, particularly from Fall River, Mass. In order to recall this apparatus quickly if necessary a separate network was established and coordinated by WIAHP, aided by WIDQ. WIGDJ/M followed the fire trucks wherever they were dispatched to keep in touch with home. W1CRN/M also aided. In calling the operation a success, the Governor of Rhode Island made special mention of communications. The whole communications undertaking was headed by WINZR, director of radio for the State Council of Defense, and his assistants WIKKE and WIMLJ who is also Chief of Amateur Radio for CD.

—W1MJJ, SEC R. I.

Seventeen SEC's submitted reports for March activities, an increase of four over February. So the steady climb upward continues. March reports add up to representation of 3150 AREC members. New reporters for March were the SECs of S. N. J., S. Dak., W. Mass. and Wash. Forty-four SEC monthly reports have been received from 21 different SECs in the first quarter of 1952. We're still not bragging, but the uprend is most encouraging.

CODE-PROFICIENCY AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW will be held on July 18th at 2130 EDST. Transmissions will be made simultaneously on 1887, 3555, 7120, 14,100, 28,060, 52,000 and 146,000 kc. The next qualifying run from W6WP will only be transmitted on July 12th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. To get sending practice, hook up your own key and buzzer and attempt to send in step with W1AW.

- Date Subject of Practice Text from May QST
July 2nd: *The Truth About the Vertical Antenna*, p. 11
July 8th: *A 50-Mc. Transmitter-Receiver for Civil Defense Use*, p. 17
July 10th: *A Car-Mounted 10-Meter Beam*, p. 22
July 14th: *A Midget Fifty-Watter*, p. 27
July 16th: *The Wavelength Factor — II*, p. 32
July 22nd: *Tools and Tricks*, p. 36
July 25th: *How To Test and Align a Linear Amplifier*, p. 39
July 28th: *Tuning Two Meters on the Car Receiver*, p. 49
July 31st: *Technical Topics*, p. 52

BRIEFS

WN1VNN was the first Novice to operate Maxim Memorial Station W1AW. While visiting the station he contacted WIKOW on 144 Mc. and WN2HCZ on the Novice 80-meter band.

"CQ, CQ, CQ," called Al/C Dan Peters of DL4TH. He combed a dead band for answers to no avail and made ready to pull the switches for the night. Answering a hurried knock at the door he heard a breathless voice inquire, "Did you call the CQ?" It happened that the 1807th AAC's Wing's Charge-of-Quarters responded because of a case of BCI in his desk-top a.c.-d.c. broadcast set three floors below. How would you log that one? — DL4JC/W8KKQ

DXCC NOTES

When the first LU1ZA cards appeared in DXCC applications, ARRL was confronted with the problem of whether to count only VPS confirmations from the Falkland Islands Dependencies or to credit cards from the LU and CE7 stations operating in that area as well. Information was obtained from the sources usually approached in DXCC Countries List problems, and it was indicated that the Falkland Islands Dependencies were generally recognized as British-owned. On that basis ARRL has accepted only VPS cards from the South Shetland, South Georgia, South Sandwich, South Orkney, and Falkland Islands, and the portion of the Antarctic continent including Palmer Peninsula. Since this policy was inaugurated, so many inquiries have been received that it was decided to consult our highest authority, the United States Government, and to let our policy be guided by that of our government. This correspondence now having been completed, we have found that no claims of individual countries to the Falkland Islands Dependencies or any part of the Antarctic mainland are recognized by the U. S. Government. Therefore, a ruling by the ARRL, to be consistent with our government's stand, should provide for the crediting of all confirmations from this area, without regard to prefixes or nationalities of stations. Accordingly, QSLs from LU and CE7 amateurs in the Antarctic region, previously rejected, will now be accepted for DX Century Club credit.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH	247	W6AM	234	WBPD	230
WSH3W	242	W3GHD	234	W6GRL	229
W3BES	242	W3CPV	233	W3EVW	229
W0YXO	239	W2BXA	231	W2QKS	229
W6VFR	238	G6ZO	231	W6SN	229
G2PL	238	W3JTC	231	W9RBI	225
W6ENV	238	W3KT	230		

RADIO TELEPHONE

W1FH	216	XE1AC	211	W1JCX	193
PY2CK	215	W8IGW	200	W2BXA	190
VQ4ERR	213	W9RBI	199	W3LTU	187

WINWO

From April 15 to May 15, 1952, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

GW3FSP	151	ZS1FR	106	ZS6OS	101
VQ1SGC	129	SM3AKM	106	W5DMR	101
W1ZW	117	DL3BJ	105	VE1EX	101
G2CNW	112	DLIYA	104	W7NIN	101
DL1UV	110	PY2DV	104	W1PKW	101
F3MS	108	GM3DZB	103	W6DBT	100
VSGAE	107	OH6OA	103		

RADIO TELEPHONE

W1BLF	114	EA4CM	107	W4DSC	100
		GM3DZB	100		

ENDORSEMENTS

PY2CK	222	W6EYR	180	ZL3AB	138
PY1AJ	220	KZ5CP	179	G6XA	135
W6TT	220	W8KPL	171	W0AIH	132
W2WZ	214	G3YF	170	W4CKB	131
W6CUQ	211	W1BLF	166	IS1IFIC	130
W0PNQ	211	CP5EK	160	W3AFU	127
W2QHH	210	ON4NC	152	W1QV	121
PY1AHL	201	W2LV	143	VE7KC	119
W5KUC	200	I1UA	141	W1OG	119
W6TI	200	G3DOG	140	EA4BH	118
G6QB	194	GAZU	140	GM2DBX	112
LUTCD	190	G8KU	140		

RADIO TELEPHONE

W6AM	181	ON4PJ	140	F9PH	113
W9ROQ	170	I1UA	140	GM2DBX	111
W3DHM	170	W3EVW	140	G3BID	110
W1LMB	160	CT1P	136	F8MY	110
W5EFC	150	W5KUC	121	F9RM	110
W8GZ	150	PY2JU	120	PY4VX	110
		Z33G	114		

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for April traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W6HQX	53	3296	3266	30	6645
W3CUL	233	2465	1952	456	5126
W6HJK	192	2622	365	136	3315
W6KYV	279	1364	402	960	3005
W3JUJ	31	1265	1201	28	2525
KG6FAA	782	817	527	249	2375
K9FAE	97	1074	1072	41	2284
W6GYH	839	762	96	23	1720
KAWAR	215	624	568	56	1463
W2BNC	13	633	613	20	1279
W4PJJ	6	599	554	45	1204
W5QHJ	69	517	571	12	1169
W7IQQ	37	499	542	36	1114
W7CZY	7	550	545	4	1106
WNZGT	10	504	488	16	1018
JASAB	140	385	291	94	910
W6NCP	46	425	421	8	900
W2BTB	32	383	397	21	833
W6BAM	39	364	262	100	765
W6GKM	6	7	59	7	759
W6BPT	5	369	341	28	743
W8AUJ	11	376	322	25	734
W7MLJ	10	361	355	6	732
K5FBM	366	163	137	45	711
W5MN	28	340	261	79	706
W9SCA	6	357	339	1	703
W2RUF	16	338	225	86	665
WTII	27	312	298	14	651
W2BO	10	275	310	41	636
W1SJO	8	304	247	53	612
WBDBR	3	305	294	7	609
W9TT	16	295	241	49	601
W4SHJ	225	166	141	17	549
W8ARO	37	254	106	146	543
W3BIP	6	272	245	7	530
W7PKX	3	262	260	2	527
W5MRK	8	257	230	30	525
Late Report					
JA2KW (Mar.)	3540	172	14	158	3884

The following made the BPL for 100 or more *originations-plus-deliveries*:

W4FOR 231	W5FOG 125	W5RIT 106
W5QVV 214	W2VNJ 123	Late Report
W3NZZ 210	W5VHY 118	W1QKM (Mar.) 148
WTBA 174	W4TRC 116	
W6GJP 143	W2AAE 114	

A message total of 500 or more or 100 or more *originations-plus-deliveries* will put you in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

TRAFFIC TOPICS

Most amateur nets are open to all comers, and this is as it should be in view of the voluntary nature of our work. Some nets which aim at high efficiency and speed have found it necessary to restrict the QNIs to certain membership, and accomplish this objective by "calling the roll" so that only these stations will report in. There are other nets, also, which move along at high speed and refuse to slow down for the casual participant who cannot maintain the pace.

Emily Post probably never participated in a traffic net, but if she had perhaps she would come up with a set of rules of conduct similar to the following:

(1) Before reporting into a net in which you are a stranger, or not a regular participant, first listen to determine whether the particular net is "closed" or "open," or somewhere in the middle.

(2) Do *not* report in unless you have traffic which can be handled by that net, or unless you have some reason to believe that you can provide an outlet which they do not already have.

(3) Wait until you know the call letters of the NCS before reporting in. Don't break in and inquire.

(4) Wait for a "break" in the traffic handling before reporting in. Don't do so in the middle of a message.

(5) Use *their* procedure when reporting to their NCS. If you do not know their procedure, listen until you get onto it.

(6) When reporting in, indicate your location or what traffic you can take briefly. Indicate your traffic, if any, in as brief and concise a fashion as possible. The extent to which the NCS has to ask you questions is the extent to which you have failed to report in properly.

(7) Once you are in the net, stay off the air except when told to transmit by the NCS. If he needs any "help," let the regular net members do it.

(8) Don't feel offended if your traffic is not handled right away. Many nets have a policy of handling traffic to and from their regular members first, visitors last.

(9) Stay in the net, once you report in, until the NCS excuses you (QNX).

(10) If you don't feel like abiding by the above, don't report into the net in the first place.

National Traffic System. Copies of a new release bearing the designation CD-24 and entitled *The ARRL National Traffic System* have been mailed out to some 600 amateurs. This release explains in detail what the NTS is and what it does. Every NTS participant should have a copy of this for reference, and anyone interested in NTS participation is invited to drop us a line or radio message asking for a copy. The initial mailing consisted of a selected list of net control and liaison stations, but we suspect that there are a great many interested amateurs who have not received this information. While it is not feasible to distribute these at random on a "throw-away" basis, we do want to make sure that anyone interested is informed. So if you want a copy and have not received one, just let us know.

One of the new features of NTS which is now on trial is the Transcontinental Corps (TCC). At this writing, applications are beginning to pour into Headquarters in response to formal invitations to participate which were mailed out to selected amateurs whose services it was felt could best be used. There are openings for a maximum of some 65 amateurs to participate in TCC functions each week, and all positions are at this writing a long way from being filled. The principal need is for long-haul stations which can operate at odd hours, particularly located in the Mountain or Pacific Time Zones. Such participation need not tie you down more often than one night a week, contrary to the belief and opinion which have been expressed by many. There are a great many good traffic men who do not have either the ability or inclination to handle traffic every night of the week. Here is their opportunity to become a vital part of NTS in accordance with their limitations.

April reports:

Net	Sessions	Traffic	High	Low	Average	Consistent
			1RN	321		
2RN	44	635	79	0	14.5	JN
3RN	38	350	41	0	9.2	All
4RN	39	464	32	2	12.0	Fla.
RN5	39 ²	497	41	0	13.0	Oklahoma
(Feb.)						
RN6	54	1341	72	2	24.8	
RN7	52	306	33	0	5.0	Wash.
SRN	30	143	21	0	5.0	Mich.
9RN	26	1169	96	4	45.0	All
TEN	43	1277	87	5	29.7	Ia., Kans., Minn.
TRN	44	85	15	0	1.9	Ont.
EAN	22	730	67	2	33.2	2RN, 3RN
TLCN	22	350	32	5	15.9	
(In.)						
QIN	60	1067	54	1	17.0	
(Ind.)						
¹ Out of 44 sessions held.						
² Out of 42 sessions held.						

Daylight Saving Time has done its usual excellent job of messing up the NTS time schedule. The only way to handle a situation of this kind is for all NTS nets either to remain on Standard Time or change to one hour earlier. Unfortunately, once again this has not appeared to be feasible, with the result that some nets changed and some did not, and most of those which did have not notified us so in many cases we no longer know when a net is operating. In the

Eastern Time Zone, most regional nets and the area net have continued on Standard Time, but pressure from participants may make it necessary for some to rearrange their operating schedule. Things are rough all over.

Second Regional Net: 2RN will have one session only at 1945 EST during the summer months.

Third Regional Net: Certificates have been issued to W3e AD AAX COK KUN QLZ and UHN. 3RN will attempt to continue throughout the summer months on EST. Section net members of the EPA and WPA nets (discontinued for the summer) are invited to participate in 3RN.

Fourth Regional Net: W4AKC is the new 4RN Manager, although resigning Manager W4ANK will continue as a 4RN member. W4AKC's appointment was effective May 1st.

Seventh Regional Net: RN7 has shifted to 7225 kc. for its first session, remaining on 3575 for the 2130 PST session. Certificates have been earned by W7s AWG LUV HKA and PKX.

Eighth Regional Net: Len sent us a copy of his very FB April Eighth Regional Net News bulletin. The following stations have earned 8RN certificates: W8s BWK FYO RJC and ZLK.

Ninth Regional Net: 9RN will remain on CST all summer, six nights per week. W9EHS has earned a 9RN certificate. W9TT points out that Kentucky was not included in the 9RN roster in the recent Emergency and Traffic Bulletin. Our apologies!

Tenth Regional Net: Manager W0ITQ wants a Manitoba contact by c.w., 'phone or smoke signals.

Thirteenth Regional Net: TRN will remain on EST, but probably on a restricted schedule.

Eastern Area Net: W8SCW says that long-haul liaison troubles are more a result of conditions than lack of personnel.

MEET THE SCMs

Nebraska SCM Guy R. Bailey, W0KJP, became interested in ham radio in 1919, obtaining his first license in 1931 with the call W9KJP.

Holder of ORS and OPS appointments, Guy enjoys handling traffic, is NCS of the Nebraska 75-Meter Net. He's a member and past vice-president of the Ak-Sar-Ben Radio Club and a member of the Council Bluffs Radio Operators Club. For his noteworthy work in the Nebraska blizzards of 1948 and 1949 he was awarded Public Service certificates. He also holds RCC and WAS certificates.

The transmitting tube line-up at W0KJP: BC458 VFO-T40-p.p. HK54s final; modulator, 811s with Splat-ter Choke and negative peak clipper. Input generally runs about 275 watts on c.w. or 'phone. Receiver is an NC-173 and the antenna in regular use is a half-wave doublet cut for 3700 kc. Operation is conducted on 40, 75, and 80 meters.

Guy's favorite recreation aside from amateur radio is bowling; his pet sports are baseball and football. A retired blacksmith foreman, SCM Bailey is now employed as a salesman by the N. P. Dodge Corp.



APRIL CD QSO PARTIES

Top score in the c.w. section of the April CD QSO Parties was chalked up by W7BSU. Elmer, you will recall, also was high man in the January shindig and deserves a big hand for maintaining his standing against some very keen competition. Second place honors were taken by W6WOO, who showed considerable improvement by climbing from eighth place in the previous party. W4KFC came through with the third highest c.w. score and rates special mention for tallying more contacts than any other participant. In the 'phone party a dark horse, W3AD, showed up in first place with a comfortable lead on the rest of the field. W4NYN and W4FV, regular high scorers in many previous parties, turned in the second and third

highest point totals. Listed below are other high claimed scores. The figures following each call indicate the claimed scores, number of contacts and number of ARRL sections worked. Final and complete results will appear in the July CD Bulletin.

C. W.

W7BSU	147,280-290-56	W1EOB	48,750-188-50
W6WOO	110,922-214-57	W3PZW	47,840-204-46
W4KFC	103,455-356-57	W9ADM	44,500-173-50
W3FQB	94,335-324-57	W1AW	43,470-183-46
W7UTM	87,618-187-51	W1CRW	38,880-162-48
W8NBK	79,430-278-57	W9NH	38,880-156-48
W7GHT	78,768-179-48	W9PHR	38,720-176-44
W3JSH	76,850-283-53	W2MHE	38,270-178-43
W7JGZ	71,900-157-50	W2AQT	35,875-175-41
W4HQN	68,320-237-56	W2KEL	35,100-149-45
W3KUN	66,480-270-48	W3PDJ	34,960-179-38
W4NH	65,455-247-53	W2CPN	34,230-163-42
W3BIP	65,070-234-54	W1JNC	34,185-153-43
W2COU	58,250-226-50	W7KWC	33,300-100-37
W1QIS	56,750-220-50	W2HTH	32,625-145-45
W5AQE	56,650-200-55	W3AXA	31,675-176-35
W3JHW	56,160-227-48	W4CKB	31,590-162-39
W6GEB	54,943-126-47	W9ERW	31,175-139-43
W8EXZ	54,825-208-51	W6CMN	30,711-87-37
W7MLL	53,712-120-48	W3LVF	30,450-145-42
W4AKC	52,875-225-47	W9KXX	30,140-134-44
W2GFG	52,825-210-45		

'PHONE

W3AD	9425-58-29	W2ILL	2250-30-15
W4NYN	6370-49-26	W1FZ	2175-24-15
W4FV	5390-44-25	W1RDV	2100-30-14
W2MHE	4510-41-22	W3EAN	1750-20-14
W1MX	3995-44-17	W4KMS	1650-22-15
W2ZVW	2775-30-15	W4DLX	1560-19-13
W6CHV	2688-18-14	W4KFC	1500-16-12
W1GKJ	2520-31-14	W8PBX	1500-20-15

"Blue Dolphin" — W2BZD/MM

The schooner *Blue Dolphin* will again cruise in northern waters this summer. Bruce Wald, W2BZD, will operate and has asked for special FCC authorization permitting maritime-mobile work in the lower amateur frequencies.

Daily watches will be kept June 20th through September 10th in accordance with the following: (If no calls are noted in five minutes, alternate frequency will be tried).

Mode	Time GCT	CST	Frequency
A-1	1430 and 2030	0830 and 14,075 (14,107 kc. alt.)	
		1430	
A-3	2045 and 2340	1445 and 14,260 (14,240 kc. alt.)	
		1740	
A-1	0000	1800	14,075 (14,107 kc. alt.)
A-1	0100	1900	7065 (7115 kc. alt.)

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.

7100 kc. (day)	3875 kc.
3550 kc. (night)	14,225 kc.
14,050 kc.	29,640 kc.
28,100 kc.	

'PHONE

7100 kc. (day)	3875 kc.
3550 kc. (night)	14,225 kc.
14,050 kc.	29,640 kc.
28,100 kc.	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for personal-inquiry traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; 'phone — 3815, 14,160 kc., 28,250 kc.

SCM AEC ORS CP SEC OBS TLS OO
OE3 AIOPA EC DXCG CLUBS RM OPS RCC

Station Activities

All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, John H. duBois, W3BXXE — SEC: ISE, RMs: AXA, BIP, E. Pa. Net: 3610 kc. On May 3rd, the Lancaster Radio Transmitting Society held its annual banquet, with the following officers for the coming year being announced: PTD, pres.; GJA, vice-pres.; OY, secy.; SNI, treas. Our Director, GEG, was the guest speaker. RQY, the Abington Township ARA station is regularly reporting into the E. Pa. Emergency Net on Mon., 2030 EST, frequency 3610 kc. In addition, RQY is transmitting Philadelphia Area Council of Radio Clubs news, announcements, etc., on 29-Mc. phone. New officers of the Lebanon Valley SRA are DPK, pres.; QCZ, vice-pres.; RCG, secy.-treas. The Lebanon Valley Net meets Tues. at 2100 on 146.8 Mc. and includes nine mobiles. The Northeast RC (Philadelphia) is planning to increase its membership. Those interested should contact RZO, secretary. The *Delteam News*, a new monthly paper published by the Delaware-Lehigh ARC, does fine job covering items of club interest and local activities. The Phil-Mont Mobile Club had a very successful c.d. demonstration on March 30th. This group also is compiling a "bible" on automobile noise elimination, which would be a worth-while contribution to the art when complete. During the Daylight Saving Time period the E. Pa. Net will meet at 1830 EST and the second session will be combined with 3RN on 3590 kc, at 2130 EST. CUL and BIP make BPL that month. OQG is at Signal Corps radio school at Fort Devens, Mass. WN3TEC now is running 20 watts on 144 Mc. and 35 watts on 3.7 Mc. Several members of the Franklin RC joined the owl and opened the 21-Mc. band at 0300 EST on May 1st. QLZ is adding 200-watt final. RCG, and SNY are going to higher power. LCK and SGB are active on 420 Mc. QLI is running 10 watts, 80 to 10, c.w. and phone. FNP is installing 10-meter mobile rig. The Beacon Radio Amateurs now is in its 16th year and elected DYI, pres. and ETA, secy.-treas. as officers at its last meeting. LVM is building a new VFO/QMPSK activity at Simpson Air Force Base. SBF dropped the "WN" after making last Nov. West Traffic. (Apr.) W3CUL 51, BIP 530, AXA 99, PYF 85, QLZ 73, AD 56, OML 53, VR 45, PDJ 42, RCG 22, QEW 20, BXF 17, QLI 11, BFF 7, CAL 6, CDT 6, DUT 5, PYV 4, BES 3, BYB 2, (Mar.) W3OML 40, QLI 14, (Feb.) W3QLI 32. (Jan.) W3QLI 20.

MARYLAND-DELAWARE DISTRICT OF COLUMBIA — SCM, James W. John, W3OMN. The Chesapeake Amateur Radio Club has changed its meeting place to the American Legion Hall, Towson. At its April 14th meeting Lt. E. S. Malone demonstrated "Crystal Grinding" and on April 28th Jim Gordon, LXK, discussed "FM Transmitters." The Washington Radio Club held a successful auction on April 14th and on May 10th movies were shown. On April 21st FOR and GHX explained single side-band principles to the Baltimore Amateur Radio Club. The BARC will hold its 5th Annual Hamfest Picnic at Triton Beach Club on Sunday, August 10, 1952. On April 25th the Rock Creek Amateur Radio Association heard DF, George Sterling, speak on the subject "Old-Timers." GHX, FQR, and HKJ presented an interesting program on single sideband for the May 9th meeting. QZC completed his 19-tube receiver and is trying it out as EAN liaison for 3RN on Tuesday evenings. Kent County, Delaware Amateur Radio Club, had a civil defense display booth in Dover for "Dover Day." MCD 3/ was used for displaying traffic. The Delaware Civil Defense Net meets Sundays 9 a.m. EDT on 3993 kc. Traffic W3PZW 257, LZM 241, CVE 185, QZC 84, ONB 48, JHW 42, MCD 18, NOE 14, HC 10, CQS 9, IL 8, NNX 6, FQB 1.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — The Cumberland Radio Association has formed a TVI committee to cover a large portion of the Club area. Full cooperation of all Club members will be necessary for this group to succeed. The published results of the V.H.F. Contest were enthusiastically received by the v.h.f. oper-

ators of the SJRA. The Club took first prize with a wide margin over its nearest competitor. ZI received the first amateur Extra Class license in the Trenton Area. The April meeting of the Cumberland Radio Assn. featured a film on radar presented by JAV. YRW is in civvies again after his release from the armed forces. Mr. J. Wilson, of Coles Lab., Ft. Monmouth, gave an exceptionally interesting illustrated lecture on captured North Korean and Russian radio equipment at the April meeting of the SJRA. Various pieces of the equipment were on hand for inspection by the Club members. KBR now is going strong on 144 Mc. Traffic and news for this column must be received no later than the seventh of each month to meet the column deadline. How about some news from the Jersey Shore areas? Traffic: W2RG 264, K2BG 219, W2ZVW 193, ZI 19, FLW 10, HAZ 8.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SVJ — SEC: UTH, RMs: RUF and COU, PAM: GSS, NYS: 3615 kc, 8 p.m. NYSS: 3595 kc, 9 p.m. NYS: 4880 kc, 6:30 p.m. NYS C.D.: 3970 and 3509.5 kc. Sunday 9 a.m. GSS has been appointed Net Manager of the New York State Traffic and Emergency 75-Meter Phone Net by ILI, Eastern New York SCM, and SJV, Western New York SCM. PYB is home from the hospital and back on 75 meters. RJJ has 150 watts on 7, 14, and 28 Mc. and 40 watts on 3.5 Mc. CBA is mobile on 28 Mc. with clamp-tube modulation and tri-band. New club rooms have been completed by the Lockport Radio Club. Gadget Night and a quiz program were held at the last two KBT meetings. BDK has Navy 120 transmitter available for c.d. work. If you are a member of IA-IP, 6BAA would welcome your call for listing in the IA-IP publication. K2DQ, JR, and QQ received Extra Class licenses. E. Merrian, former service manager for RTMA, spoke at a RAWNY meeting on TVI. FCG resigned as AC for Zone 5 c.d. and the NYS office of c.d. has appointed PWN as Zone Coordinator. VIQ and RJJ are active in NYS traffic. WZM is home on leave from the Navy. FCG lost his sixteen-element 144 Mc. beam at Upper Liste because of the wind. SFW is on 420 Mc. and QSOed Scranton, Pa. On April 5th the first annual get-together of v.h.f. men in the vicinity of Binghamton, Ithaca, and Sidney was held at Whitney Point. The Rochester DX Assn. was very active in the ARRL DX Contest. FBA, QJM, REF, TXB, SAW, DOD, ICE, and BJH have reported. SGJ, TEX, and ZEL installed a bedside rig for THK. Zone 9 and 10 have established 2-meter Zone nets for c.d. The Erie County AREC manned a radio booth at the Alert America C.D. Show in Buffalo. JEY won an award for his operating at the North Central New York Science Fair in Watertown. Also operating were JWU, WZQ, and GVH. RJL and DNE are on s.s.b. with UMF exciter. The Rochester v.h.f. group met at the home of TVG. NYS d-meeting in Binghamton was attended by 150. BTB, DEX, GSS, LQM, OUT, PWN, QY, RJL, ROL, RZP, SDA, SDX, SJV, TQY, UTH, ZOL, and WNZMSY. GSS and ZT visited the SCM to talk over their plan activities for W.N.J. New appointments: GSH and STJ as OO, RJJ as ORS, UAD as OES; GSS as OPS. RUF made BPI total deliveries and total COU received WAZ forward. BTB is back on the air after being in the hospital. Traffic: W2BTB 833, RUF 66, ZOL 378, WAI 322, COU 279, DJF 128, GSS 123, V1G 57, ZPN 43, SJV 35, RJJ 16, K2DG 12, W3QAA 10, EMW 4.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — The following have had appointments cancelled: RIS, LSS, LGM, QVL, LIW, LQQ, and YA. Please send your monthly reports so that they reach this office by the end of each month. The Fort Necessity Radio Club staged a STAG Gabfest on June 7th at Uniontown. The Upper Ohio Valley Emergency Net now has gone v.h.f. under the watchful eyes of RXT, KWH, the 144-Mc. band is humming each Wed. at 8 p.m. W3SHX has worked 36 states (all confirmed) on 80 meters. W3NSIV, of Kittanning, has 29 states and wants to get acquainted with the local boys. NRQ was Field Day chairman of the Steel City Amateur Radio Club. OOB is a new member of the Club. NKM says his bandswitching VFO is swell. OKU is working single sideband and 160 meters. RSL now has an 829-B final. We understand MPO and CTN have State level nets fairly well organized. Incidentally, we wish CTN a speedy recovery from his recent illness. MTP is displaying his Class A ticket. Now that OMY has his beam up again we wonder if we will hear him on 2 meters. Down Jeannette way Western Pennsylvania's most faithful reporter says he and TVA have a "local 80 net" going on 3510 kc, each Mon., Wed., and Sat. at 7 p.m. for all Westmoreland and ex-Westmoreland County hams. Congrats to NJH and the new jr. operator, AER, our DX man first-class, says 14 Mc. is very poor and that his son now has his own station and is active with the call W3NTQL. KNQ reports TVI receivers are

(Continued on page 78)



Pardon us, but here's a complaint letter
that we could not resist publishing.

December 12, 1951

THE NATIONAL COMPANY
MALDEN, MASSACHUSETTS

Gentlemen:

I am writing you about something that has just gone wrong with my HRO. It's a plain HRO, not one of the fancy new ones from the post-war era. It was built by you and purchased new by me in October 1939, and now, after all these years, the filter condenser in the power supply has blown. This is its first really major failure. Two years ago I replaced a couple of resistors and the r.f. gain control because their values had changed more than 10% from recommended circuit design. I still use the old "pot" in another rig.

Incidentally, your advice of a decade or so ago has more than proven its worth. I have forgotten exactly when, but you will remember recommending leaving the heaters on continuously to decrease failure from thermal strains. Except for the few times the set has been moved, this policy has been rigorously followed. The net result has been replacement of only a handful of tubes in more than twelve years. A majority of the original ones are still in there punching.

In these days when reliability is the keynote of modern electronics, it might be well to go back and examine some of the design practices that have stood the test of time. Those in my HRO certainly have.

It is seldom one has a chance to praise a failure. I am happy to register my "complaint" about the filter condenser and at the same time congratulate you on the superb record established by this fine old set.

Sincerely yours,

JAMES M. BREARLEY (W3GZQ)



spoiling his traffic sessions. Up Erie way QN sends in his usual fine report via paper clippings. We are sorry to learn that NNX had an accident. We are happy to report OTE is home and convalescing very nicely. LKJ reports excellent progress on the emergency trailer. BPP does a swell job in his Sunday newspaper editorials concerning amateur radio and all phases of radio operation. The 75-meter net of the Lake Erie Emergency Net will be discontinued. TMK is a new one in Erie. A report from QN, Erie County Emergency Coordinator, shows 25 full members and 4 supporting and 40 per cent have emergency power. Traffic: (Apr.) W3GEG 198, NCD 125, UHN 64, KUN 30, AER 9. (Mar.) W3GEG 154, AAX 40, AER 14. (Feb.) W3GEG 92.

CENTRAL DIVISION

ILLINOIS — SCM, H. F. Lund, W9KQL — Section Nets: IEN, 3940 kc.; ILN, 3515 kc. SEC: QLZ, Asst. SEC: HPG, RM: BUK; PAM: UMT. EX-KG6GC is on 20-meter c.w. from Hillsboro with the call SFD. MBI and ZHB are conducting daily 420-Mc. tests in an attempt to correlate propagation conditions with weather and barometric pressures. KQX says the 2-meter VDX eight-element "Long-John" is just another good Yagi. 144 Mc. is coming to life for IFA but 50 Mc. remains a dead issue. After spring house cleaning ICF still is hunting his 20-meter coils, spare crystals, and mike which he had hidden behind the sofa. NSL has new doublets for 14 and 7 Mc. The Midway Club at Zion has begun code and theory classes. DOH received his 1st-class phone ticket. STZ's daughter married and Pop has his new son-in-law studying for a Novice Class license. OCG got rid of TVI and now he can't get a signal out of his back yard. A new Novice in Chicago is W9NREP; with 5 watts JIN is working out well. BA/mobile was NCS during the massed emergency disaster mobilization of 24 fire departments at Mascoutah Lake. Thirty-five pieces of firefighting apparatus were mobilized. Mobile units reporting fire trucks as they passed certain positions were KTH, JSQ, GPN, and KUC. Others assisting were QJP, QJY, PAM, MDB, CJJ, QQA, UAY, #RUCJ, and 8IHC/9. W9NRW is on 80-meter c.w. and 2-meter phone in Peoria. Traffic: (Apr.) K9FAE 2284, W9EBC 269, CSW 255, UQT 236, SXL 145, BGN 95, CEE 69, BUK 67, LXJ 43, STZ 40, KQL 30, LTR 29, DOR 21, CTZ 10, MET 8, LIN 3. (Mar.) W9LJN 11, NN 8.

INDIANA — SCM, Clifford C. McGuire, W9DGA — The DARA mobile group raced plane spotter information with regular telephone service and tied. NH schedules 710 on 160-meter c.w. NZZ still handles the Arctic traffic. DKR is building new rig. New Novices in Martinsville are SWM, SYG, SWC, and SSQ. KTX handled urgent traffic with reference to obtaining watermelons for a sick child in Chicago. JUJ is the new manager of the Central Area Net, in addition to QN. APG has new HRO and is building new transmitter. DAG is working Novices on 80-meter c.w. EWR works 7 Mc. New officers of the Kokomo Club are YDP, pres.; W9NPK, vice-pres.; W9NQBBL, secy-treas.; DKR, rep. at large. YDP has received his WAC. DKR has 110 stuckers. DRXCC, DKR has TVI-proofed his transmittor. ORZ is building new c.w. antenna. GHF returned home after 18 months of naval service. The Calumet Emergency Net is operating on a frequency of 1805 kc. and the Net Manager is DRJ. UKT is building new mobile rig. New EC for Howard County is DKR. LZI has installed a voice-controlled relay for phone operation. TT is a new REC. DLJ and EUJ work 80-meter c.w. from Hobart. Total IFN traffic for April was 151. On April 27th the Indiana Radio Club Council held its meeting at Frankfort. Eleven clubs were represented by 31 delegates. QLW has recovered from a case of the hives. The XYL of DKS now is W9NWL. GSY changed his cascade receiver to coax input for 144 Mc. V.h.f. operators please forward your call to the SCM. FJI is studying for his Advanced Class license. New members of the Lake County ARC include JRY, PKF, JDM, DRJ, PAS, PKG, FVE, and Novices QPR, QBN, RES, and QNJ. If your county does not have an EC, make recommendations to the SEC. LZI, JBY, reports RFN traffic for April as 131. Traffic: (Apr.) W9JUL 2525, TT 601, JBQ 363, NZZ 330, DGA 182, TUG 149, BJK 130, KTX 105, LZI 97, JTX 95, KDV 78, EZW 68, DHJ 64, FYM 58, RCB 48, DOH 40, WBA 36, JZB 19, QLW 19, DKR 18, MUR 15, ZIB 6, GSY 4, NH 3, YVS 1. (Mar.) W9JTX 78, IFR 8, IZC 3.

WISCONSIN — SCM, René W. Goetsch, W9RQM — SEC: OVO; PAM: ESJ; RM: IQW, CBE, C.W. net (WIN) 3625 kc., 7 p.m. daily; slow speed at 6:30 p.m. Phone net (BEN) 3950 kc., 6 p.m. daily. WJH worked Waukesha on 144 Mc. GFL is trying out new 183D. HHD/M worked LRT in Indiana for a nice haul with the mobile rig. OOD is Asst. EC for Beloit. SGG is using TV beam and lead-in as 34-wave vertical top-loaded on 3.5 Mc. SBQ received his Extra Class license, one of the first in the section. RYA has a new Viking transmitter. Approximately 350 were in attendance at the Wausau Hamfest on April 26th. 1DIY, Ass't Secretary of ARRL, was guest speaker. The newly-formed Wisconsin Council of Radio Clubs elected JXY, pres.; ART, vice-pres.; ONY, secy.; BCC, treas. Communications for the 32nd Div. Memorial Day Autocades were provided through facilities of MRAC, many State EC nets and mobiles, and BEN stations. IFS is new ORS. WLZ renewed EC appoint-

ment. If there is no EC appointed for your county, OVO would appreciate information on eligible candidates to complete state-wide Emergency Corps coverage. Don't forget the BEN picnic at Sturgeon Bay. KXK took a vacation trip, visiting HQF, HUZ, and other DXers en route. CFP uses SCR-522 on 144 Mc. with folded dipole for antenna. FAN took in several April 144-Mc. openings to Illinois, Indiana, and Michigan. The following Novices are active on 144 Mc.: OOW, RNJ, RNI, and RXI. TQ is working on new exciter to relieve the SCR-522. PGF has new mobile in operation. LED's auto has a new Morrow converter decorating the interior. FPE is on 144 Mc. from Willard week ends. LEE is looking for Green Bay 144-Mc. stations every Monday night along with his regular skeds. NYS is having antenna and converter trouble. EYN has a new mike. Traffic: W9ERW 175, SFL 84, IQW 73, CXY 72, IFS 65, SDK 29, DR 18, HDV 10, RQM 9, CFT 8, FDX 8, CEP 6, NHG 6, OOD 5, LSK 3, IZE 2, KXK 2, OVO 2, SGG 2.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Everett E. Hill, W9VKP — Grand Forks hams really are going to town on a new club. The Sioux Amateur Radio Assn. has been formed with 46 charter members. Officers elected were: GZD, pres.; RGT, vice-pres.; OGZ, act. mgr.; BKB, secy.; and TSB, treas. The Club will have a permanent shack in the new NDU Engineering Building. Plans are for a kw. rig on all bands. Grand Forks now has 18 Novices as result of its training program. The Williston Amateur Club now has 25 members. BKZ has a training program there and is turning out the hams. The founders and officers of the above clubs are to be commended on their excellent work. Clubs should be formed in all the towns in which there are two or more hams. They can lend much needed assistance to the newcomer. Mayville is a fine example of assistance with 15 hams there. Your SCM can give you assistance on organizing clubs. Be sure and affiliate your clubs with ARRL and make use of the aids they have. Traffic: W9JVP 26, GSR 10.

SOUTH DAKOTA — SCM, J. W. Sikorski, W9BRN — SEC: GCP, RM: OLB, ZIQ. Sioux Falls, has been discharged from the Army and is back at his old stand at Power City Radio. Winners in the Sioux Falls ARC 5-watts-or-less WAS Contest were BLZ, PHR, and MPQ. UVL Pierre, announces that the 75-meter phone net will operate Sundays, 9:30 a.m. (CST) during the summer. Mitchell Radio Club members are building several 2-meter rigs. UVL has teletype ordered and is the first South Dakota member reporting that activity. The SFARC held an auction of parts donated by KSQO. Two activity reports were received this month, and none from clubs. Traffic: W9EHO 78, PHR 37, RRN 32, UVL 6.

MINNESOTA — SCM, Charles M. Bove, W9MXC — The Mobile Amateur Radio Corp. of Hennepin County had 15 minutes on TV. They showed the inner workings of their station, PZT, and a demonstration of the opening of their pack sets and mobile set-up. Well LIL finally did it. He calls W9NRRD and she will run 75 watts into an 812 on c.w. VE4KM was a visitor to the Twin Cities and made a visit to the MRRC transmitter at the Hennepin County sheriff's radio station. KOW is building a mobile rig for 25 and 10 meters. BYQ now is operating mobile portable S in Michigan. AME has been operating portable while out smelt fishing. KYE paid a visit to the Twin Cities for a check-up at the hospital. JVV has purchased a new HRO-50 receiver. The Duluth Radio Club held a combined field day and picnic which was a success. The Club also has organized a very active TVI committee. DHP moved to Milwaukee. DQL is building a new final to go with his Lysco as a driver. The Southwest Radio Club is working on a plan to secure better relations between TV set-owners and the amateur. PYU has moved to Anamosa, Iowa. QJO is operating on 2 meters and looking for contacts. W9HFP is planning on going on the air with a BC-457. The Marshall Red Cross disaster committee asked the Marshall Radio Club for a ham station at its headquarters in case of flood. SKQ, BGJ, UYY, FFO, QJQ, QEL, and FLE responded and set up a station on 10 and 75 meters. BGJ and QJQ now are on 75-meter mobile. DXY now has his General Class license. The Minnetonka Radio Club is a new club at Excelsior. Officers are QZ, pres.; WQF, vice-pres.; and VSE, secy-treas. WQF is doing a fine job conducting code classes at Excelsior. Traffic: W9UCV 129, AA 92, HEO 85, AII 32, TJA 26, TKX 25, BUO 20, MXC 20, DQL 15, KNR 15, BRA 13, RXL 9, K9WAW 8, W9JNC 4, OPA 4, YUN 4.

DELTA DIVISION

ARKANSAS — SCM, Dr. John L. Stockton, W5DRW — The meeting at Eureka Springs was well attended with more than a hundred amateurs making a grand total of 214 present. Our thanks to AAE for a grand job and for making the hamfest possible. See you in Eureka next year. TNM is new EC for Fayetteville and has organized a good emergency plan. FA has been QRL working on 2nd-class phone ticket. MET is MM again and has been working the DX. BAB has new 37-ft. tower for his 20- and 10-meter beams. PUN is at San Diego in the Marines. I wish to take this opportunity to thank all of the hams that have sent in

(Continued on page 80)

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reports during my term as SCM. I also would like to urge each and everyone to report to the new SCM, LUX. Let's give him all the cooperation that we possibly can to make his job more pleasant. Also a special thanks to EA, our SEC, who, in addition to doing a good job, never missed reporting.

Traffic: W5RWJ 150, EA 46, LUX 45, DRW 37.

LOUISIANA — SCM, Robert E. Barr, W5GFH — FEZ has just been appointed EC and holds OBS and OPS appointments. KRX, recommended by our RM, NG, becomes the latest ORS. LDH/LXX is an OES besides carrying on his duties in promoting the Amateur Radio Emergency Corps as Emergency Coordinator. Activity reports are needed from all stations. Send them to the SCM.

MISSISSIPPI — SCM, Norman B. Feham, W5JHS — 9QSO/5 is a new OBS and ORS appointee. ARRL bulletins will be sent at slow speed on 3700 kc. at 1930 CST and repeated on voice immediately after on 3975 kc. This is good practice for the Novice who can check his copy on the voice transmission. VME is on 7 Mc., PFC, TDO, and SYR are new calls in Jackson. PFC is on 75 meters and is a member of the GCH Net. Jackson mobile stations made a very good showing in the Civil Defense Parade. There are now 17 mobile stations operating on a net frequency of 28,592 kc. RDA is working DX with A.C.-D.C. rig running 6 watts. PRY and SNQ are in the services. TLAP has closed down for the summer but WZ has arranged a shed with 3CUL to take traffic from this area. K5FBB checks into GCH, Tenn. phone, PX, RN5, OON, and TCPN Nets, which accounts for the FB traffic total. PGF has given quite a few hams throughout the State their first aeronautical mobile contact. Traffic: K5FB 711, W5JHS 113, WZ 102, RIM 101.

TENNESSEE — SCM, D. G. Stewart, W4AFI — This being the last report from your retiring SCM, I want to take this opportunity to thank each and everyone for your most excellent cooperation. It certainly has made the job easier and is truly appreciated. It has been a genuine pleasure to have served you. I am sure you will find CXY a capable, friendly, and willing successor and urge that you give him your wholehearted support. HIB recently received MARS "Station of the Month Certificate" for August '51, which is quite an accomplishment. FLW demonstrated emergency gear and gave a talk on c.d. to the local Rotary Club. NNH is interested in 6 meters and is building crystal converter for that band. NPS is getting back into the swing on both 'phone and c.w. OGG, operating from Sewart AFB, turned in a nice traffic total. TRC, operated by KARC, made BPL on originations for servicemen. New officers of the KARC are PID, pres.; KJV, vice-pres.; SWW, secy.; CBU, act. mgr. UVP is active on 3.5 and 7 Mc. WN4TJB, UVQ, VVY, and USN are active in Johnson City. Traffic: W4CXY 150, OGG 149, ODR 128, TRC 116, HIB 91, PMR 16, RHO 16, AFI 14, SZI 12, FLW 11, NPS 10, NDC 2.

GREAT LAKES DIVISION

KENTUCKY — SCM, J. W. Lyle, Jr., W4KKG — TAV and NRP send in a nice report on traffic. TAV says DX is not so hot. The band is always dead when she's on. HI, FR delivered a lot of messages from overseas this month. JUT again makes top rating in Frequency Measuring Tests. KTA makes WAS. Congrats! URF is going up for General Class ticket. CDA is working on new 20-meter ticket. WBG makes BPL with a nice total. VP received Extra Class ticket. Congrats, Doc. MGT works four nets! SSQ operates on 40 Mc. in Corbin. SZL keeps daily tickled with TYP. MKJ is NCS of the 144-Mc. net along with TUV, TLU, OXC, NWT, and MMM. LVE, KMX, MOP, NE, and KRG of Southern Bell, have been QRL with work. They handled microwave link for the Derby telecast. They know how to feed now to operate on 7000 Mc.! Summertime is here again and everybody is getting sunburned. Take time out from that lotion application to drop me a line on the report, if it's only to let me know about the string of fish you caught! Traffic: K4WBG 432, W4TAV 365, MGT 244, MWR 136, CDA 49, W5QDT/37, W4MKJ 28, KTA 27, VP 13, KKG 11, SZL 1.

MICHIGAN — SCM, Norman C. MacPhail, W5DLZ — Asst. SCMs: R. B. Cooper, SAQA, and J. R. Beljan, SSCRW, SEC; GJH, RMs: YKC, UKV, and ELW, PAM; UTH, New appointments: EC (Benzine County) to JXE; ORS to HKT, AXP reports his and MHHI, ZWM, QPO, and WNSJEF took part in the 4-hour CAP test of plane-spotting. The test took place Sunday, April 20th, and we understand it was very successful, with the amateur stations doing the long-haul traffic. GEH advises a new club is being organized in Zeeland with the Ottawa County gang reactivating the Monday night emergency net at 8 p.m. on 28,700 kc. TQP is trying out phase modulation. Sounds good. HKT still is drooling over his visit aboard the USS *Courier*, where he got a good, long look at the 150-kw. Voice of America station. NQ still is active on MARS nets. RJC says overseas traffic has slowed up a bit. THG says the OCD meetings in Detroit were very FB. Many Michigan amateurs attended the entire course. New officers of the Central Michigan ARC are EGI, pres.; TCY, vice-pres.; CKK, secy.; SCW, treas.; with FSZ and TLI on the board of directors. GJB advises the Great Lakes Emergency Net on 160 meters will be closed until Oct. 1st. UES took the big jump. When will the new XYL get her ticket? Don? EXZ is up to his grid leak, building new rigs for 21 and 420 Mc. ZGT made BPL for the third

straight month. This gal really moves it, and is the first one to top 1000 points in a long, long time. FNH is no longer a bachelor. We need more news items and club notes on those traffic reports — please! Traffic: (Apr.) W8ZGT 1018, RJC 410, URM 273, SCW 210, QBO 195, JYJ 169, DAP 142, TZD 132, ZLK 126, WNO 109, NZZ 101, ELW 77, NOH 75, CPB 66, RTN 58, AXP 53, COW 50, SHF 59, DLZ 43, THG 41, LR 36, IV 31, HKT 29, EGI 25, SJF 25, DQL 22, ILP 17, UGD 17, AQA 15, GJB 15, JPY 10, QIX 10, WVL 10, TBP 6, EX 5, KSL 4, LLD 4, PUV 3, TIC 3, UES 2, (Mar.) W8NOH 123, DAP 103, CPB 37, NZZ 30, TQP 18, UGD 15, IKX 14, DOI 6, YMO 2.

OHIO — SCM, John F. Singer, W8AJW — Asst. SCMs: C. D. Hall, SPUN, and J. Erickson, SDAE, SEC; UPB, PAM; PUN; RMs: DAE and PMI. Apparently the warmer weather has torn several of the ladies away from their rigs, judging by the decrease in reports this month. ARO again made BPL, the "easy" way and also the "hard" way. Newly-appointed ECs are HOX and QZC. IZD has been made OO, Class I. FEZ is AEC in Lorain and YFB the same in Elyria. ARO is arranging with 3CUL to handle overseas traffic during the summer shutdown of TLAP. BN needs outlets in Akron and Youngstown. GAV is closed down for rebuilding. TLW is working on SCR-522 gear for use on USCGR auxiliary frequency. YGR participated in all 26 sessions of BN. LBH is struggling for his first 21-Mc. contact. W8NKKAL is a new Case Tech amateur. The 25th Anniversary Banquet of the BSWRA held on May 3rd was a great success, with almost 100 attending. Congratulations to RSP and UKS for their FB SS scores. Local winners in the Cuyahoga County 10-meter groundwave contest were AJW and EMZ, while out-of-county awards were taken by BFH and BSR. CACARC has formed a TVI steering committee which is cooperating with the FCC Detroit office. TZD has rebuilt and now is on with 250 watts. AEB has taken over DAE's spot in SRN. CBI is temporarily off traffic nets while rebuilding. W8N&YN QSQed 12 states his first week on the air. New OCARC officers are AUN, pres.; EYE, vice-pres.; WRL, secy.; and AL, treas. WRL is taking care of the list of Ohio amateurs for the license plate issue set for next year. He can be contacted on Monday evenings on the Dog House. Net frequency of 3860 kc. at 6:00 p.m. EST. YHH has been appointed director of CARA to replace HAM, who has left the State. According to reports, UPB is doing his usual spectacular job in c.d. work. ET has replaced BWC as West Park delegate to the CACARC. The latter has left Ohio. CARA's TVI Committee has been formed and now is functioning in grand style. AQ is trying to get his mobile rig to percolate. Springfield's Q6 tells us that JNK has a 522 transmitter on 2 meters. EPA received a JA card for WAC. DCJ has a new mobile rig, and IMQ passed his General Class test. The latest recipe to appear in Toledo's *Shack Gossip* is for orange cookies. Other notes state that GRJ received his Advanced Class license after only a three-day wait. AZB will operate portable W5 from Camp Polk, and CNI and ZNU are attending radio school in Pennsylvania. It is noticed that some of the older boys have become a bit lax in reporting. Let's oil up those creaking joints and get on the ball so that the young bucks won't be showing you up too badly. Oh yes, another double traffic list this month — let's see what we can do about it. Traffic: (Apr.) W8ARO 943, FYO 361, DAE 140, CBI 126, CDA 95, AL 10, QJF 44, LC 25, TLW 32, YGR 30, RN 18, EQN 16, PMJ 10, AJW 6, ET 4, (Mar.) W8RN 46, TLW 14, EQN 12, GAV 11, AQ 8, IZQ 7.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — RM: TYC, PAMs: LIG, JQI, and K2CA. VP qualified for Extra Class license and is going for commercial. DVZ has just tied the knot. BTV expects DX with his new conical beam on 14 Mc. LEI has been a maritime mobile and has just returned from Rotterdam. The Ray Van Winkle Club participated in Field Day activity. Two rigs were in operation using both A1 and A3 emission. The following calls were Novice, but now are General Class: KHQ, JKJ, and IHI. EWO attended the YL get-together dinner held in Boston. Dolores is active on 1.8 and 3.5 Mc. NYS meets on 3615 kc. at 7 p.m., and NYSS meets on 3395 kc. at 8 p.m. daily. These nets will remain on Eastern Standard Time. Novices interested in a section net are urged to drop a card to the SCM. Keep your appointment effective; check your endorsement date now. Albany County AREC did a fine job in the recent c.d. test held at Albany. The group was under the leadership of ECs AWF and SUL. HF recently moved to Pleasantville. BR8 has been inactive since October because of high water in his cellar. Traffickers attention: Don't let the other fellow carry the load, pitch in and give him a hand. NYS and NYSS need your help and support. The present interest of HTH is DX traffic. The AARA has standard QSL cards and is planning a new year-book. A Ladies' Auxiliary now is associated with the Club. BNC again makes BPL. Please note Helen's total. Phil Rand, IDBM, was guest speaker at AARA. EFU is mobile on 144 Mc. UKA is QRL because of the illness of his XYL. Recent appointments: HF as ORS, K2CA as PAM, HEI as OBS. Endorsements: HTH as ORS, LRW as OPS. Traffic: (Apr.) W2BNC 1279, LRW 300, TYC 216, EFU (Continued on page 82)

An important message for Amateurs in TV fringe areas

Television interference, particularly in fringe areas, despite the manful work of hams, has continued to keep thousands of us off the air. Reputable television receiver manufacturers have, by and large, improved the design of their sets. But, as rapidly as the art has permitted, television viewers have stretched the range of TV transmitters. Pictures that are far from acceptable in an engineer's laboratory, somehow seem to satisfy TV fans.

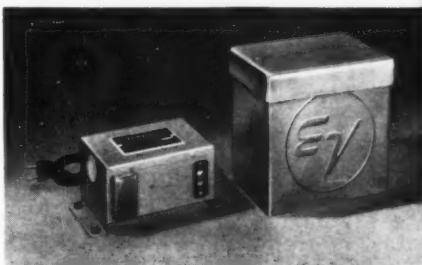
TV and TVI

And, there is a large group of accessory manufacturers who have complicated our TVI problem, unwittingly perhaps, by selling television boosters or preamplifiers—some good, many mediocre. We, at Electro-Voice, make television boosters, and are mighty proud of them. They are *engineered* with the same skill and search for perfection that has been the hallmark of Electro-Voice products for over twenty years. But, as a result, we hams at E-V have contributed our share to the TVI problems by pressing on the frontiers of TV still further . . . a *lot* further than the average booster previously made possible!

How We Are Helping

We have tried to make a good product, and it has brought pleasure to thousands of families. Now through E-V, boosters are going to be better than ever . . . for customers and for hams. Every E-V booster is equipped with an integral high-pass filter where it can do the most good . . . right at the input of the amplification stage.

The E-V Booster was the first fully automatic, broad-band booster to be marketed. The E-V Tenna-Top Booster is the only broad-band, all-channel, antenna-mounted booster made. All E-V boosters incorporate a lesson learned long ago by amateurs, that high gain without low noise is useless. So, all our boosters have gain *plus* an extremely low noise factor.



E-V Boosters are going to continue to give a hefty boost to TV signals, but they will work equally hard to keep interference, ham and otherwise, out of the television receiver. Recommend an Electro-Voice booster to your neighbor! You will be doing him a favor and yourself too.

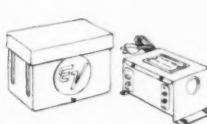
W9IOP

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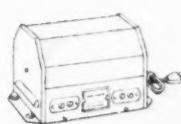
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88, ILL 45, PHO 35, WN2APH 17. (Mar.) W2BNC 452, VP 19, HEI 17.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, Jr., W2OBH—Asst. SCM, Harry J. Dannals, 2TUK, SEC; KTF, RM; TUK, PAM; YBT. The Tu-Boro and Nassau Clubs are setting up skeds around the country to handle traffic for the Ninety-Niners Women's Air Race over the July 4th week end. Favorable publicity should be gained from this endeavor. Your SCM noted the presence of BOT, QYZ, and BSP at the DVRA Old Timers Night in Trenton. YOT writes from AF base in Korea that he has itchy fingers for a key and hopes to be back again in October. KTF replaces SYW as SEC for the section. Good luck, Chuck, and we hope to have Ray contact us from Germany this summer, where SYW will be stationed with PAA. DRD was the first to report QSOs on the 21-Mc. band and worked a few locals despite heavy TVI to his own set. VFI, VSN, and WN2MRD are the latest members of the New York Radio Club and in the same club AMB, CYK, IXE, and ZKJ have received their Extra Class licenses. DIR has been appointed Brooklyn Alternate EC under BIV, Borough Coordinator, and the Brooklyn AREC boasts 110 members and held 22 drills during the month. BO will be in W6-Land for the summer. AEE, the Columbia University Club, is becoming active and setting up gear on all bands and using the call 8CT5/2 until its new call has been issued. EC reports the TLAP will maintain modified summer sked on Mondays, Wednesdays, and Fridays at 1830 EST on 7260 kc. The Williston Park C.D. Radio Club was formed and elected OBE, pres.; QAN, secy.; IRY, vice-pres.; and VOY, trustee; and the Club awaits its new call. The Tu-Boro Club has revived its bulletin, *Sparks*, and is celebrating its 17th anniversary and creating activity by issuing certificates to members contacting five other members by any band or mode. DID attained OBS for the Smithtown Area nets. ZNM now is stationed in Washington, D. C. operates KA4USA often and works at NSS as electrical technician. EYB became a member of the A-1 Operators Club. AOD now is using automatic CQ tone wheel on 420 Mc. along with MWB and both QSO QRM regularly. KAC is working WIs and 3s with three-element beam on mobile, on 144 Mc. on band openings. FL, Nassau EC, reports county control c.d. station was set up with good coverage over the entire county on all bands used. PRE, Manhattan EC, boasts 12 mobiles and 10 fixed stations, mostly on 10 meters. TUK, NLI Traffic Net RM, reports the net handled its season's high with 239 messages and 34 different stations active and states the net will remain on DST during the summer on 3630 kc, at 1930. LPJ is maintaining 10 schedules a week and trying hard for BPL. GIO has received OES appointment for activity on 420 Mc. and will put a 420-Mc. TV signal on that band with its own sync. and blanking generators. 420-Mc. activity is lively in all parts of the section except Brooklyn and Richmond. Maybe a section 420-Mc. round table could be arranged. AAG and DIC are the newest OES appointees along with DGF, who plans TV with a flying spot scanner. Traffic: (Apr.) W2BO 636, VNJ 349, AEL 232, EC 186, OBU 174, LPJ 156, GP 139, BIV 120, DZB 64, DRD 50, TUK 49, BGO 37, LRI 31, ZKJ 24, OUT 18, YBT 14, IN 13, BGW 12, LGK 12, DID 10, PF 9, WN2KFV 6. (Mar.) W2PZE 10, IAG 7.

NORTHERN NEW JERSEY—SCM, Thomas J. Ryan, Jr., W2NND—SEC: VQR; RM: CGG; PAM: CCS. For the summer, N. N. J. traffic nets are operating on Standard Time. "JN" meets at 8 P.M. daylight time. The Second Regional Net meets at 7:30 P.M. for the first session and at 8:45 P.M. for the second session. Anytime you have traffic, put it on JN and it will be on its way through the Second Regional Net. A very nice report was received from DRA concerning the organization. In Morristown, Headquarters station NPC is located in Borough Hall. DRA's staff includes LWW, NCQ, MJC, ODA, DBW, ANW, BLS, CDO, CPI, NYI, IET, JJR, JLZ, LMQ, NDY, NEL, OV, QKT, and UZC. CUI came through with a 241 traffic total for the month. QPS, late of Maplewood, now is on 144 Mc. from Livingston. COT is running 200 watts on 144 Mc. The Livingston Club completed 144-Mc. converter project. A committee to investigate cases of TVI has been formed by the Northern New Jersey Radio Association. ADB is chairman, assisted by AQT, DOZ, JUO, and ZBY. The NJNRA has the following new members: WEC, TYW, IML, YJE, HEJ, MOB, and K2DD. OUS is sending Official Bulletins on 146 Mc., at 6:15 P.M. and on 1880 kc, at 6:18 P.M. on Tues., Thurs., and Sat. NYV received "Worked Canal Zone" certificate. LFI moved to Metuchen. VPL is studying sonspots and calling the turn on 144 Mc. LRO is the proud pappy of a YL. GRZ again is living in Highland Park. EKU is using a Twin Yagi on 144 Mc. CWK has 99 countries confirmed. ABL reports his son, ZEP, formerly a regular on JN and now in the Air Corps, is stationed at Keesler AFB, Miss. DXD now is mobile on 10 and 75 meters. LSH is new EC of Kearny. Area #3 in civil defense, as well as Essex County for ARRL, now is under the leadership of KLA. We strongly urge all Essex County amateurs to keep him informed of their progress with AREC and c.d. activities. Traffic: W2ANG 243, CUI 241, LMB 172, CGG 135, DXD 122, EAS 171, MTV 106, OUS 6, CJX 4, ABL 2, CWK 2, NIY 2.

(Continued on page 84)

MALLORY HAM BULLETIN

WHAT TO LOOK FOR IN A UHF TV CONVERTER

Dear OM:

Many communities are preparing to welcome UHF television for the first time. As a result it is probable that you will be called upon by friends, neighbors, and relatives for technical advice regarding the possibility of using a VHF television receiver for the reception of UHF channels.

For your information, UHF reception is entirely possible from a conventional VHF TV receiver provided a suitable outboard Converter is employed ahead of the set. In such a combination, the original TV receiver functions as an i.f. amplifier, and UHF tuning is accomplished solely by means of the Converter.

Unfortunately, the effectiveness of this arrangement depends almost entirely on the skill with which the Converter was designed and manufactured. It is true that a well-designed Converter will tend to overcome some of the deficiencies of a mediocre TV set. On the other hand, it is just as true that a poorly designed Converter will always produce inferior results no matter how good the TV set might be. In view of this, a very deliberate study of every angle of UHF Converter design is justified before recommending purchase of this or that UHF Converter.

One of the points which must be considered is the tuning range of the unit. Does it provide reception of all UHF channels? Or does it limit the user to a choice of only a few of the available channels?

Does it have antenna pre-selection? (The answer to this question is exceedingly important to the amateur, because of the ever possible TVI as a direct result of poor input selectivity!)

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Is it stable in operation? Is it easily tuned, so that even a child can enjoy UHF television?

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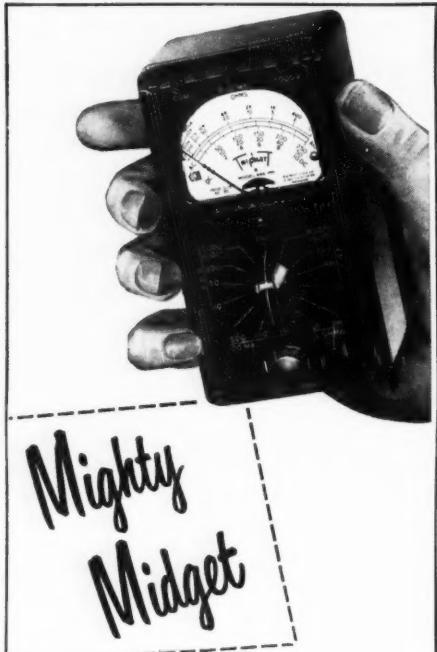
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MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — Asst. SCM, Dr. Albert J. Ploog, ØSCA; SEC: VRA. RMs: QVA, SCA, HMM. BDR crowded SCA for top traffic honors for April with 609 handled. Top activity in Iowa was that of the gang at Sioux City and Council Bluff during the Missouri River flood, but reports from those participating are practically nil. The fellows did a great job and NXW, XYL, was in there pitching with the boys. BDR now has his Advanced Class license. DFD now is in New York teaching NFL in home on boot leave. SEF is EC for Harrison and Shelby Counties. YTA has his new VFO working and has received his appointment as Asst. Mgr. of TEN. New on TLCN is JMX. PZO has a new QTH and again is active on TLCN. BDL has a new final using 813. FDL reported that the fellows along the Mississippi all organized in anticipation of a flood. At a recent election YUA was elected NCS for the Iowa 75 Phone Net, with IYV, VCM, GIM, and NTB as alternates. PP is honorary NCS and the board of directors is as follows: PP, chairman, FKB, NTB, YRR, and DWD. Traffic reports were fine but news reports were very scarce this month. Traffic: WØSCA 703, BDU 609, YTA 204, QVA 131, BBZ 74, NYX 41, SEF 32, WMU 26, DIB 24, DFD 17, ATA 14.

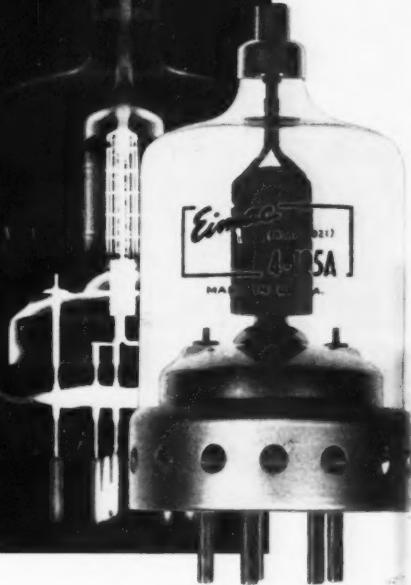
KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. RM: FDJ, PAM; HEC. The QRS Net is doing real well at its new meeting time, 2030, Mon., Wed., and Fri. on 3610 kc. The Kansas 75 Phone Net is functioning on regular schedules handling quite a bit of traffic. Practically all drills have mobiles reporting in. We also notice new Acting Net Controls, WØHAW, an ARRL member and also an RCC member, tells us that EZT now has General Class ticket. The Missouri Valley Emergency Net reports 96 traffic points. The Mo. Valley Radio Club was busy during April preparing for Field Day. IWS and CWG, of Atchison, monitored 3.9 and 28 Mc. during the flood and handled flood traffic when needed. WIT and NCV, of Topeka, have a 100-watt all-band mobile rig to go into Doc's car. It uses 829Bs in the final and also in the modulator. SWR, on 75 meters, and GCD, on 10 meters, are new mobiles in Topeka. Members of the KVRC "Steering Wheel Net" of Topeka recently drove to Lawrence for breakfast holding their session en route. The boss of the SWN, ECF, is a busy man. One Monday night his chinchilla population increased by three and the next night he was the proud papa of a 7-lb. YL jr. operator, and he hasn't missed an SWN drill. On Apr. 6th the Coldwater Amateur Radio Club held a hamfest attended by 50 licensed amateurs. Prizes were won by QNC, for the farthest QTH, CKV, as holder of the oldest ticket, and WØHHI, as holder of the newest ticket. Traffic: WØML 220, CY 214, FJ 33, PB 15, ICY 5, KXL 4.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. The St. Louis Amateur Radio Club met on April 18th and viewed the civil defense film "A Voice Shall Be Heard." This film has been shown at a number of clubs and is a very fine example of civil defense. Guest speaker at the April 18th meeting of the HARC was Mr. P. N. Powell, HGB, manager of the Precision Products Company. During the April floods in the Missouri River Valley the Kansas City Red Cross Station, RVG, was active for a two-week period. Mobile stations were used at different points along the river and fixed stations frequently were used as relay stations. Stations reported to have participated in this emergency work were AWII, LBM, RVG, BGP, RDR, NDS, CBS, VRF, DNE, ITX, NNU, PCY, UBR, FHI, WHK, and KØFAY. Missouri was well represented at the "hamfest" sponsored by 5AAE at Eureka Springs, Ark. Harry Paston, from Headquarters, gave a fine talk to the gathering. The following additional stations handled traffic during the March Arkansas storm disaster: BCD, BGQ, BVL, DEQ, JXN, LNK, RDR, NDS, NXJ, and VRF. KWBD has a Viking I on the air, however a BC-610 is expected to be in operation soon. QNT and INI are active on 420 Mc. UBR has a new jr. operator. BVL reports the Early Bird Net is off the air until October. KØFAY makes a nice traffic showing. ZLN is running 500 watts to a BC-610 and makes first traffic report. EBE has rebuilt his new exciter and improved its efficiency. CXE is operating Viking I with Viking VFO. WAP is back on the air. QXO ranked No. 1 in the amount of traffic handled during 1951 in Missouri. New appointments: ZBR as EC, PME as OBS, and IQY as OPS. Traffic: (Apr.) KØFAY 223, WØBVL 195, GBJ 186, PME 144, CFL 132, KWBD 105, WØZLN 75, OUD 47, EBE 40, KIK 31, HUI 27, CXE 16, CKQ 10. (Mar.) WØIQY 117.

NEBRASKA — SCM, Guy R. Bailey, WØKJP — About 150 amateurs from this and adjacent areas took part in the flood emergency this month and YMU, who spent many hours in organizing and directing their work, is to be commended. AUH is building a new final for his rig. YOF is putting up a new antenna. GJI now is a cadet in the merchant marine. CC is building a TV camera. CCY is reporting in the 75-meter net. The Ak-Sar-Ben Radio Club had a party Mar. 29th. The Club's c.d. mobile unit was the nucleus of the flood emergency operators. AJQ has a new HRO-50, and LRD is sporting a 75A-2. BXJ is doing a nice job as OO, and is having fun getting back on c.w. after his many years on 'phone. The c.w. nets are folding up for the season be-
(Continued on page 86)

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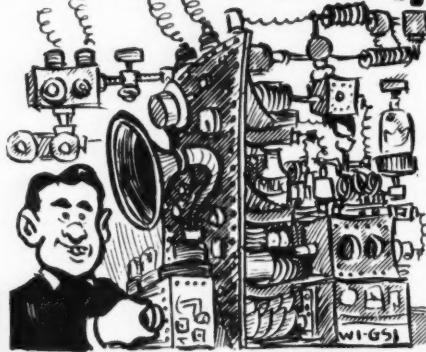
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cause of QRN. It is hoped to have many new operators next fall as the Novices find out the fun of handling traffic. JDJ is doing a fine job in SEC, and put in many hours along with HQQ and BXJ in coming up from Lincoln to work during the emergency. NVE and UVU, from Fremont, and VPR, from Lincoln, worked long hours away from their regular business. The NE CM wishes to thank all of those who were active during the emergency, also the many Iowa stations who participated. Traffic: W4IDJ 126, FQB 109, CBH 53, LJO 47, AUH 33, BXJ 26, QHG 24, JED 10, HQQ 9, UFD 7, VPR 6, YMU 6, HXH 4, YSK 4, WKP 2, LRF 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF, PAM; STU, RM: KYQ, CPN, 3880 kc.; CN, 3640 kc.; CEN, 29,680 kc. With the advent of Daylight Saving Time activity has started its summer lull and very little of interest has trickled through in the nature of reports. TIB has its new Viking on the air. ODW has been working all bands from his comfortable position in bed recuperating from his recent operation. DHO works LO-NITE with his one-half watt crystal rig. EMF reports that UFW now has a Class B ticket and operates 29,680 kc. with a TBS-50. BVB still is busy with his OO work. BHM, ZL, and KV renewed ORS appointments. BHM is getting squared away in new location. RWD is finishing the c.d. station in Woodbridge. BBV is building a new rig that he hopes will be TVI-proof. Thanks for the traffic reports this month, but unless you include some news with them this space is going to be quite empty. It is impossible for any one person to report all the news of our section and it will have to be forthcoming from each and every amateur in the section or there just will not be any. So send along anything that might be usable and it will be digested and used to the best possible advantage. Traffic: (Apr.) WJSO 612, KYQ 263, EMF 178, AW 54, STU 50, NBP 45, LIG 43, BDJ 39, RFJ 27, HYF 26, KV 26, BVB 24, HUM 24, RWS 14, ODW 11, NEK 8, RRE 7, DHO 2. (Mar.) WILIG 29.

MAINE — SCM, Orestes B. Brackett, WIPTL — SEC: BYK, RM: LKP. Net frequencies and time: Pine Tree Net, 3596 kc., at 1900 DST, Mon. through Fri. The Sea Gull Net closed for the summer. AUG has been awarded the Extra Class license by virtue of the grandfather's clause. Others we know of who have Extra Class licenses are MJR, EBJ, TO, CBV, PMY, and DPJ. New Advanced Class licenses we know of are TLK, TAU, and SWR. General Class licensees are UPQ (XYL of LER), UZR, and VBV, a twelve-year-old boy from Belfast. VV has been ill and now is in Portland trying to get his strength back before returning to his work at Bingham. Sea Gull Net certificates were issued to EZR, LN, EBJ, PGZ, GLZ, SCS, and GMH. Traffic reports and news probably will be running light during the summer months but we sure would appreciate anything of importance that comes up for the Maine news. The radio club at Auburn still is growing, with two new members, Hank Martineau and Ray Small. Apologies to Vernon Burgess, of Caribou, for forgetting the nice report on the Aroostook County Radio Club, which held a meeting at Limestone with a fine chicken-pie dinner served by the Limestone gang. Those attending were JSY, LNL, UWT, SYU, TMY, DDE, VDL, HUL, HXQ, LYR, SFL, ILU, JPC, FDL, Alton Bridges, Sterling Tibbets, Gene McLaughlin, Clarence Benjamin, Milton McRae, George Lauman, and George Morris. Traffic: WISEJ 76, LKP 73, PTL 44, OHT 41, HXQ 18, EFR 13, QEK 11, OLQ 10, IXC 9, GRK 3.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, Jr., WIAPL — New appointments: ECs — RDV, Sharon, ADM, Canton, JXM, Avon, RQW, Abington, QVN, Randolph, MB; Seituate, OBE; MME, ND; RDV, ORS/OPS — RDV. Appointments endorsed: OIS — RDV, ECs — Wallingford, HRG, Malden, PAM 6-6 Rotators, AWA, OES, JSM, PXH, MEG, BHD, OPS — GDY, DJ, OQ, NF, AYG, ORS — DMS, GM and ALP attended the Norfolk County Radio Assn. banders and the following officers were elected: NOV, pres; GDY, vice-pres; UFJ, secy; AYL, trans. HS8 has moved to Rutherford, R. I. The Braintree Radio Club elected RDV, pres; KPX, vice-pres; AUY, secy-treas. The South Shore Radio Club elected MME, pres; OQO and QMD, vice-pres; OTZ, secy; TZQ, trans. Nat Hallenstein, ex-JIMA, is the new engineer in charge of WI-Landi. Sorry to have to announce the death of PCC. NBT now is in Quincy. VQK is living in Holbrook. UVF has a new beam on 144 Mc. and an antenna for 3.5 Mc. The Hingham Radio Club has the call VPR. Active on 144 Mc.: DSY and NWK. Bridgewater, JQH Stoughton, WNVVOU Weymouth, WNUH MC mobile. GEO is back on the air on 28 Mc. TSB has TBS-50C and SX-71 on 28 Mc. JSM is active on 144, 3.5, 7 Mc. AXA is communication coordinator for Swampscott. UUT is Bob Morse of Haverhill. The Gypsy Radio Club had HP, OLN, and QUY at the Great Bay Radio Club chowder party. Theory classes are given each Thurs. by REI, FEC. Middleboro EC, has station checking in on net on 1.8 Mc. The Quanapawitt Radio Assn. has a net on 29 Mc. Wed. at 7:30 p.m. BB. Winthrop EC, puts out a very nice bulletin. The South Shore Club had HDQ as a speaker. The Eastern Mass. Club and the Quanapawitt Radio Assn. had PKW as a speaker. NF has rig on 1.8 Mc., a 50-watter; also a rig for 50-Mc. mobile (Continued on page 88)

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and has Extra Class license. DJ is active on 50 Mc. The T-9 Radio Club held a meeting at CYV's QTH. BB reports RK, DDO, NWO, BCR, PBQ, QFO, MGP, 90WVK/1, and 6ENF/1 on 21 Mc. the first day. URR, Woburn, is on the air. 88 furnished field stations at the foot and on the top of Mt. Ascutney, Vt., for Conn. Sports Car Hill Climb. RLF has Class A. BID has walkie-talkie for 28 and 144 Mc. CTR has S2B on 144 Mc. BB has new 32V-3 for portable emergency work. BGH has a new antenna. PU reports that the Deep Sea Dragnet is on at 11:45 A.M. MME is in this Net and also in TCPN. UE has a rig on 14 Mc. AKN is going to Charleston, S. C., with his boy, 4SRA. EPE is active in Eastern Mass. Net. The Old Colony Amateur Radio Assn. had a radio booth at the Rotary Club's Exhibit with QKM, FGT, SE, HPV, and SUR assisting. WNIUPZ will be Net Control for the Novice net on 3725 kc. The South Shore Club's call, IA, is being used for c.d. work in Quincy, with a station on at the Police Station. A meeting of Sector 5, Region 5, was held in Quincy with FWS, KWD, KCT, SH, OEJ MD, OVK, ALP, QKY, ADM, CQN, MME, EKG, and Dedham civil defense director present. A net is going to be on Tues. at 8 P.M. each week. DMS has mobile rig on 28 Mc. PEX has BC-91 on 1.8, 3.5, and 7 Mc., also a BC-342A receiver. DWO put up antenna for XYL, TU1, on 1.8 Mc. TVZ is on 28 Mc. IUC is new EC for Amesbury, with RFB assisting him. New hams: VJL, ex-3NRF Boston, JVO Winthrop, VJQ Saugus, VJY, ex-VN9ELJ, WNS VKB Newton, VKD Newton, VKE So. Boston, VLM Revere, VLX Lexington, VLZ Weymouth, VMM Falmouth, VMO Salem, VJK Boston, VVK Somerville, VKL Wilmington, VKO Falmouth, VKP Brighton, VQK Malden, VVK Weymouth, VKS Newton, VKT Law, VMD Lynn, VML Waterford, VU Brantree, VVM Cambridge, VMM Holbrook, WNIVMA Newton. The New England Emergency Net on 1.8 Mc wound up the season when Daylight Saving Time started with the following active: ROR, TKE, LSN, PXJ, QZR, QWP, TFE, MUJ, FEC, FVD, IAS, MGP, NWL, RSY, TOA, TTV, and LYD, with SS as NC and JES Ass't. NC, MLZ is on 28 Mc. TYP has mobile rig. RVK has HQ-129X receiver and beam for 28 Mc. KCP-UDE is out of the Army. OLP is a member of Walpole Propagation Society on 28.592 kc. Mon. at 7 P.M. HB is on duty at Charleston, S. C. The Eastern Mass. Club members were guests of the Yankee Radio Club in Salem. UXB has Tech. Class license. NWO is on 21 Mc. Traffic: (Apr.) W188 301, EMG 296, NUP 230, JME 147, JCH 133, UE 104, TY 87, EPE 67, DMS 28, PU 28, BB 15, RDV 15, AKN 14, AVY 13, BY 9, YR 9, LM 7, PEX 6, DWO 4, QON 3, BGH 2, URR 2, (Mar.) WIQK 150.

WESTERN MASSACHUSETTS — SCM, Victor W. Paonoff, W1EOB — SEC: JYH, PAM: RDM, RM: BVR. The summer schedule of West Mass. Net on 3725 kc. is Mon., Wed., and Fri. at 7 P.M. RHU placed 13th nationwide in the Westinghouse talent search. He is making plans to further his education at M.I.T. Extra Class licenses were obtained by IHQ, NY, and UD. New homes with new lawns, gardens, etc., are keeping many of us off the air. Including COI, EOB, and JYH. Listen for BDV's 10-watt mobile from his York Beach, Maine, vacation-land. TZQ would like to spend all his waking hours handling traffic. Wish the same interest could be aroused in a few more of our gang. Removing the TVI from a rig can be a tough job, but BVR has turned the trick. He says that ham radio was never like this before. SWJ is converting Command transmitters for 10 and 20 meters. This summer undoubtedly will result in a lot of station improvements. During this period I would like to give serious consideration to the problem of improving our Western Mass. Net performance and participation. What can be done to reinterest you old-timers, and what is necessary to bring new blood into the net? Will you please drop me a line and let me know of your opinions and suggestions? A happy vacation to all of you. Traffic: (Apr.) W1BVR 55, TZQ 31, TAY 23, EOB 22, SDT 12, BDV 10, RHU 10, GJV 5, RRA 3, WNTVJ 3, QJN 1, (Mar.) WITZA 56, RHU 36, QJN 11, GJV 8.

NEW HAMPSHIRE — SCM, Norman A. Chapman, W1JNC — RM: CRW. The N. H. N., 3685 kc. meets at 1900 Monday through Friday. The Merrimack County Emergency Net, 28.6 Mc. meets Tuesdays at 6:30 P.M. TNO reports he has made WAS. Ted says that Utah was the tough one. UNX is back on the air with a souped-up Harvey-Wells and a couch-spring antenna. The Great Bay Radio Club put on another "Good Time" at Hampton Beach. Cal Hadlock, from National Company, was guest speaker. The Concord Brassbounders enjoyed a steak and lobster feed at the summer QTH of BFT, COC, TTU, and WNIUAU were initiated into the Club. The Fourth N. H. QSO Party was a huge success. Twenty-eight stations have now qualified for WNH certificates, with certificate No. 18 going to KP4KD, San Juan, Puerto Rico. If you missed the last issue, take time to date for the next one. Many worked any DX on 21 Mc. Traffic: (Apr.) W1GMH 38, JNC 27, QJN 16, FZ 6, (Mar.) W1HS 18.

RHODE ISLAND — SCM, Ray B. Fuller, W1CJH — SEC: MJL, RM: BTM, PAM: BFB. RI Net meets Monday through Friday at 1900 on 3540 kc. I am happy to announce the appointment of RVQ as Assistant SCM of this section. A1 is an ardent and very active ham and can be contacted

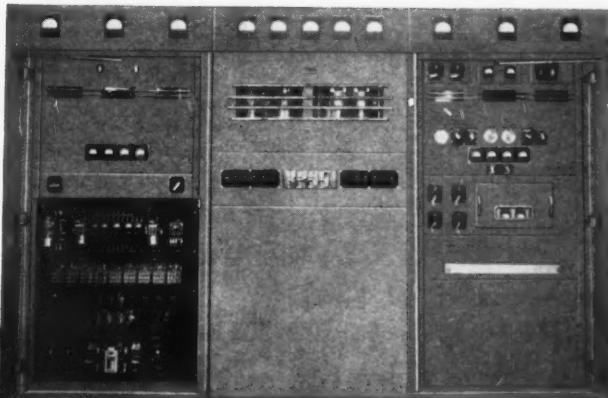
(Continued on page 90)

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on most bands any evening. As his business takes him to all parts of the section, make yourself known to him and have a personal contact with a Communications Department official. NAARO held its first all-emergency power drill. The Club station was powered by a gasoline-engine-driven generator in the basement and six mobiles were in the field. Some flaws appeared that will be cured. That is the importance of drill in discovering weaknesses in emergency set-ups. NCX is the new president of NAARO, elected to fill the vacancy occurring because of the departure of KNE. LWA is active again on 10-meter mobile. DXer KG6GU now is residing here and awaiting a W1 call. BBN is recovering from surgery. His big traffic count is missing in this report. Traffic: W1TRX 56, OK 30.

VERMONT — SCM, Raymond N. Flood, W1FIPS — PAM: AXN; RM: OAK. Asst. RM: TAN. The Vermont-to-Outside QSO Party was a success despite the shortage of publicity. Forty-three Vermont stations participated, although some were limited for time. Watch for this next year. It will be bigger and better! JLZ reports a new Novice in St. Johnsbury, the Rev. Father Jean Paul Laplante, WN1VMC. Many Novices have taken General Class exams, those passing that I know of are WN1UBL and WN1UET, FB, girls! The Vermont C.W. Net went on summer akef May 26th. Look on 3520 kc, Mon., Wed., and Fri. at 7 p.m. EDT. The Vermont Slow-Speed Net will QRT for the summer. NDB/1 is a new c.w. net member. PZX, AHN, SS, SCE, and SIO supplied communications for the Midget Auto Hill Climb of Mt. Ascutney. Traffic: W1OAK 181, RNA 132, AVP 118, FPS 43, IT 36, TXY 15, SVT 4.

NORTHWESTERN DIVISION

ALASKA — SCM, Glen Jefferson, KL7NT — Acting SCM, A. Jack M. Walden, KL7BK. NT has returned from an extended trip Outside, and will assume SCM duties from now on. The Fairbanks Club has done a fine job in getting communications set up for c.d., with its system inaugurated by Gov. Gruening. The Club also is getting well organized on the hamfest coming up Aug. 2nd and 3rd at Copper Center and is hoping for lots of mobile activity. 3892 kc. has been chosen for the calling frequency. A fixed station at the hamfest site will guard this frequency. Let's have a good turnout from the whole gang this year. The Fairbanks gang promises lots of fun for all. The Anchorage Club is growing steadily, with 60 members at present. AGU, AOT, AEE, and UM volunteered as a committee to try to trace down some of the extremely bad QRN in the Anchorage Area. They find that trying to locate anything definite reminds them of the proverbial needle-haystack situation. Best wishes to NT as SCM, and 73.

IDAHO — SCM, Alan K. Ross, W7IWU — Mountain Home: Application for AREC was received from PCZ, major at the Mountain Home AFB. Call at the AFB is K7FBL. IY, from Grandview, visited me recently. He is on 80- and 40-meter c.w., but operates on 160-meter 'phone at times. Grangeville: Our new EC is KOG, WN7RKY applied for AREC and hopes to have his General Class ticket soon. Lewiston: IDZ is new OPS, ONP's third harmonic has appeared — a boy. OOW checks into the FARM, OEN, and WARTS. Lewiston-Clarkston Radio Club officers are DTJ, pres.- OOW, vice-pres.- ONP, secy.-treas., and IFG, Assistant EC. PRM is EC. Blackfoot: LQU is on the FARM Net and also MARS. Rupert: IEY reports he is moving to Empire, Ore. White OBS, Louis, has put out 368 bulletins since Jan. 1st. Thanks for your help in the Idaho section and good luck for the future. Boise: The Gem State Radio Club is holding summer picnics.

MONTANA — SCM, Edward G. Brown, W7KGJ — Special thanks go to GSV, who set up emergency equipment April 4th and 5th and handled emergency traffic for the Red Cross during the flood disaster at Havre, Mont. Other stations that worked hard during this traffic were JDZ, CPY, LBE, OOV, IWW, BFW, BIS, FIV, MVD, JFR, NPV, EOI, FTO, BXL, 6HMA, 5OPQ, 4JXJ, #HOC, and K7FAR. WSBTV/7 is settled in Billings and has his rig fixed up on 80 meters. Norval, better known on the air as Hank, is announcing for KGHL. BNU was in Billings shopping for a house trailer. Deck plans to retire soon and spend some time seeing the sights and meeting hams he has worked. The Rocky Mountain College Campus was the site for the Billings Club Field Day activities. Charles Crouter spent a 14-day leave at home with his mother and OM, CT. Charles is in the Naval Electronics and has just completed boot training. Sure would appreciate a few more activities reports. Traffic: W7JDZ 141, CT 57, KGJ 51, LBK 19, BNU 8.

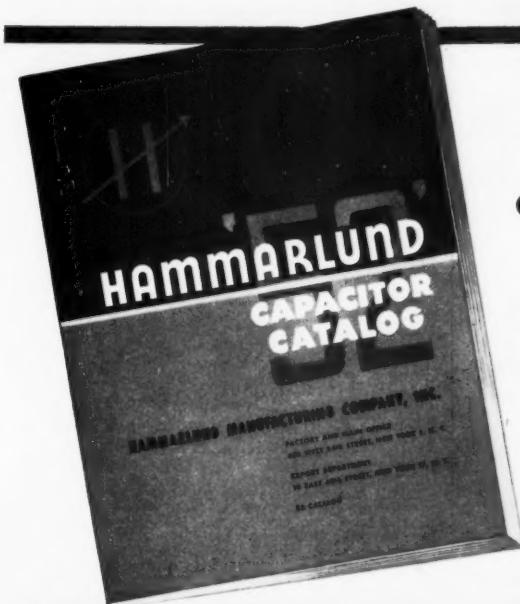
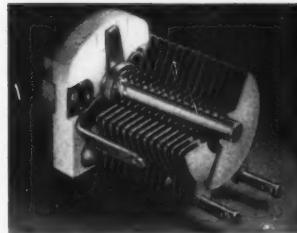
OREGON — SCM, J. E. Roden, W7MQ — ESJ invites amateurs to contact him if interested in MARS and he will answer all inquiries with no obligations. He again makes BPL with a score of 651. LAA is touring the Northwest, being on an extended vacation from his new California home. HSL says that OEN 3600-kc. Net is progressing satisfactorily but more stations still can be used to added advantage. MLJ is high score man in Oregon this month with a score of 732 and also makes BPL. LVN has been busy playing with radio-controlled boat and is quite pleased with the results. RNU is a new Novice in Pendleton. He is the son of MQ, the SCM. Congratulations are in order for GNJ, who

(Continued on page 92)

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has been selected as the outstanding radio amateur in Oregon for the year and was awarded a beautiful cup at the annual OARA Convention at Eugene. MQN, a new ham, has moved to Pendleton and is with Forest Service as radio technician, having replaced MRJ who has left to take a new position with RCA Laboratories. HAZ wants all who can to attend the big hamfest at Baker about the middle of June. This is an annual affair which seems to be growing each year and draws amateurs from 3 states. IM is new EC for Lakeview Area. HSL is a new ORS. SF also is new EC for the area between Oregon City and Salem. MLJ maintains daily sked with Japan and handles a lot of traffic from the boys overseas. Traffic: W7MLJ 732, H1651, OJG 373, APF 222, HDN 96, GNJ 71, MQ 62, JLU 39, FY 33, ADX 32, LVN 30, HJU 28, HSL 27, KYO 26, NOR 23, KTG 19, BDN 18, HSL 17, IEJ 14, NFU 12, EUG 11, KLE 6, EDU 4.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — SEC: BTW, RM: FIX, PAM: NRB, KTL has Motorola installed in new car and now is 10-meter mobile. Clark County had a nice set-up for Field Day. KCU is against the FCC proposal to eliminate Advanced Class license. CWN has low-power phone on 3.9 Mc. to work mobiles. ESM is attending Mount St. Michaels in Spokane. New stations reporting into WSNet are BAQ, CZX, HNA, KZ, OHY, PYW, QGH, and QLE. EVW operates 29.3-Mc. mobile with the Tacoma Emergency Net. FRU is on the mend after a serious illness. MSI finally has mastered TVI and is enjoying traffic work. AIB is busy with antenna experiments. JWE moved to new location with the same address. GVC built sound-powered phone system to aid in emergency work. RT, DL, ETK, LY, and others took in the OARA Convention. OFE blew up his transmitter and had to send it to the factory for repairs. NSI is working on MBY's 2-meter rig trying to get 24-Mc. rock to oscillate on the over-tone. NTU is new OPS. Under the management of BAQ a new net has been formed for newcomers to traffic ranks. Named "Washington Oregon Net" (WON) it will operate on 3585 kc. at 1900 PST Mon. through Fri. This is a restricted speed net. 15 w.p.m. maximum. Newcomers to traffic from Oregon and Washington are invited to join. PHO moved from Three Tree Point to Lake Burien and works 80 and 40 meters and holds sked with brother QLE. NLT has 833A final on 20 meters. MKT is building half-kw. rig for all bands. Newest member of VARC is QGB, who just advanced from Novice to General Class. PFZ passed Advanced Class and received 2nd-class commercial ticket. QQQ is stationed at the Tacoma Naval station and works 10-meter phone. The Valley C.D. Net now has 3 mobile and 6 fixed stations on 29.510 kc. New Novice in Puyallup is RED. OHI is ready for action with his mobile rig. PHF has 80-meter portable rig. NNQ is rebuilding his 75-meter mobile. MCF is with the Coast Guard in Florida. JJK is at Camp Hood, Tex. OEB is putting up outlet on WSN. The VARC had a fine set-up Field Day. BAC is moving to San Diego and is getting up a 20-meter beam for GVN and BA has a new HRO-50-1 receiver. JNC and JXR are building all-band mobile rigs with VFO. PHV works for SERAD. FKL rejoined the ACS. LAF has beginner radio class at Riverfront Hts. AWP has 75-meter mobile with VFO in a 4 x 5 x 6 inch box. Traffic: W7IOQ 1114, CZY 1106, BA 410, EVL 248, FIX 154, MSI 95, KCU 71, AIR 56, FWD 56, FRU 49, ETO 36, CZX 27, OEB 23, PGY 18, MBY 16, EAU 14, KTL 10, NWP 9, JWE 8, EVW 7, GVC 6, GAT 4, NRB 3, ZU 3, NTU 2.

PACIFIC DIVISION

HAWAII — SCM, John R. Sanders, KH6RU — Considerable interest was aroused in Hawaii by the latest FCC Amateur Proposals. The clubs on Oahu, Maui, and Hawaii have all taken polls on the various issues. Nine Extra Class certificates have so far been issued in the section to EL, ZX, LI, EM, DK, MG, KS, AO, and SL. Active at the opening gun on 21 Mc. were LI, RU, MG, and YL. As we go to press with this report news comes that Hawaii will have TV shortly. Those many QST articles on TVI which we have been able to skip over so happily will have to be put to use now! For Pacific Area: JA2ES/KR6JD is very active traffic-wise and has applied for ORS appointment. KH6AEX is now KG6. JA2KW reports a belated BPL total for March. KG6FAA's monthly totals continue to grow with solid BPL for more than a year now. Traffic: (Apr.) KG6FAA 2375, JA8AI 910, JA2ES 70. (Mar.) JA2KW 3884.

NEVADA — SCM, Carroll Short, Jr., W7BVZ — SEC: JU, ECs: HJ, JLW, JVW, KOA, MBQ, OXX, TJY, VO, and ZT. RM: PST, OPS: JUO, OO: LGS. Nevada State frequencies are 3660, 7225, and 29,360 kc. This is the last report of your present SCM. Beginning next month it will be Ray Warner, JR, who will be writing this report. Here's wishing him lots of luck and hoping he gets monthly reports from all appointees. MRN, JU, and BVZ are on 21 Mc. BVZ got Extra Class ticket — the hard way! MPJ is portable on 7 and 3.5 Mc. PSC is on 3.5 Mc. from Nellis. Novice RNZ, in Gardnerville, was trained by TJY. VO has a new receiver, an AR-88, and a 2-kw. emergency generator. NWU is phase-modulating his little Collins rig on 3.9 Mc. KIO resigned as Las Vegas EC; OXX is the new EC. WN6FWX/7 now is WN7KKE. I'll still be watching 7225 kc. in the daytime. Traffic: W7JU 18.

(Continued on page 94)

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SANTA CLARA VALLEY — SCM, Roy I. Cousin, W6LZL — SEC: AEV, ECs: CLF, IXJ, JWD, QIE, CER, CLJ. The SCCARA had QYT from Stanford. The subject of the talk was Instantaneous Prediction of Radio Transmission Path. The Monterey Bay Radio Club had Professor A. Sheingold, of the Dept. of Electronics and Physics at Navy Line School. The subject of the talk was Single Sideband. The NPEC had a guest speaker from the Hopkins Eng. Co. The subject of the talk was Noise Suppression. The second meeting was held at its new location at the Elm Court Recreation Center, Spruce Avenue, So. San Francisco. PMK is the new club call of the NPEC. New appointments are MMG and IUV as OO, and CLJ as EC of the Salinas Area. Endorsements of certificates went to AEV, CER, GFJ, and MMG. QNK and TFZ, who did very fine jobs as EC of their areas, have had appointments cancelled. New calls in the area are WNG, NOG, OJO, PBN, PIE. FYK still is looking for the TVI-proof rig. BPT still is going great guns in the traffic efforts. RFF is reworking the 20-meter beam while the band is in poor condition. ZXS is on 80 and 40 meters with new 832 final. GCG and NBD are on new 21-Mc. band. YWD got up a new 144-Mc. antenna at new QTH. MUY is QRT while building a new house. The San Mateo County Amateur Radio Club held its Fifth Annual Hamfest June 1st at Coyote Point, San Mateo. The SCARCA is planning for its Annual Hamfest August 9th at the Wieland's Brewery, San Jose. RUO is chairman of the Bar-B-Que committee. CFK is in charge of publicity. Traffic: W6BPT 743, HC 31, MMG 29, RFF 6.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Ass't. SCMs: Guy Black, 6RLB, and Julio Amaro, 6WGM. SEC: RVC, RM, IPW. PAM: KZF. With JZ on a trip East the task of writing up the section notes falls on RLB. Therefore, I can report a few things about the OM himself. Ray is a fellow who is always spending hours of his spare time doing things for other fellows for which he gets little credit. An example is running code practice three times a week. Ray is a genuine experimenter who can make his gear sit up and beg. At one time or another he has taken part in every kind of amateur activity — even phone! He recommends his S-36 with Panadapter and sniffer probe for stubborn TVI cases. Among those opening up the new 21-Mc. band at zero hour were JZ, KEK, and HKF. WB talked on pi networks to the NBARA and the SARO. The editor of the NBARA's monthly bulletin now is ATM, who does a fine job. JDO reports working a portable KC6. The May meeting of the CCRC was held at the home of DNX. A trophy is to be awarded the club with the best Field Day score, according to rules agreed on at the meeting. See WGM for details. Among those present at the April 19th Pacific Division Director's meeting were BF, EY, WGM, NJO, HOR, and QDE. All the TVI committees were sorry to hear of the resignation of Frank Roach from the FCC staff. Good luck in your new job, Frank. The SARO held its first hidden transmitter hunt of the year. The Richmond Club has reactivated its TVI committee. PLB is switching to 2 meters. RXW now is on the Peninsula. Traffic: W6IPW 192, QXN 152, JOH 29, EJA 13, WOJ 11.

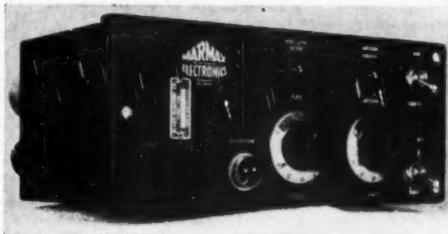
SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — Phone JT 7-5561. SEC: 6NL. Phone PL 5-6457. Marin Area: EC: KNZ. Tamalpais Club EC: ZL. Visitors at the April meeting of the Tamalpais Club were OEL, HST, and 6BMA, the latter from St. Paul, Minn. NEA was proposed for membership. YME's call was "picked out of the hat" to be used as the Club's Field Day call. MQQ and FQS were appointed to serve on the Marin Area TVI Committee, joined with Marin Radio Club members LUM and BCM. Reorganization now being complete, the Marin Club meets the second Friday in a new meeting place, the American Legion Hall, Larkspur, Calif. The Tamalpais Amateur Radio Club meets the third Friday in the home of OZC in Tiburon. All are welcome to both clubs. Santa Rosa Area: EC: LOU. Congratulations on their election to all the new officers of the SCRA. They are EBL, pres.; WDM, vice-pres.; and JTR, secy.; while DTV and DZM are the new directors. Mr. Frank Roach, FCC engineer, and R. F. Czeikowitz, SCM and Vice-Director, were present at the May meeting to provide the Club TVI Committee, ADM, DZM, and KIW, with procedures and technical information on handling TVI complaints with the FCC. The meeting was held in Sonoma, with members the guests of the Naval Reserve unit there. The SCRA now has 16 stations on 144 Mc. and 6 on 28 Mc. active in civil defense. Many thanks to JTR for the news. The Sonoma County Radio Amateurs meets the first Wednesday in the Taproom of the Grace Bros. Brewery, Second St. west of the Freeway, Santa Rosa. Eureka Area: EC: SLX. New members of the Humboldt Amateur Radio Club are Larry Tipton, Bob Olsen, Henry Pierson, and Dalee Dolson, WNGJTD, who has an ARC-5, and has made more than 70 QSOs. Congrats to Gene Bass on his new Novice call and to KTV on his new Advanced Class license. J. Lane Dame has had a busy time — he has joined the HARC, has taken his exam for Novice license, and has received his "greetings" from the Draft Board. Remember the Simulated Emergency Test in October and prepare to do an even better job than was done last year. Eureka has been assigned TV channels 3 (Continued on page 96)

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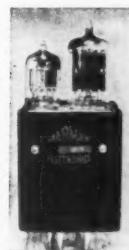
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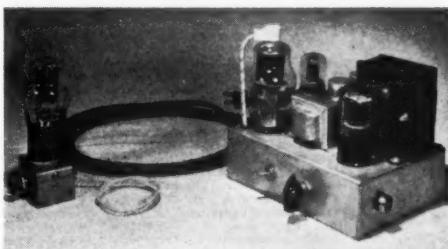
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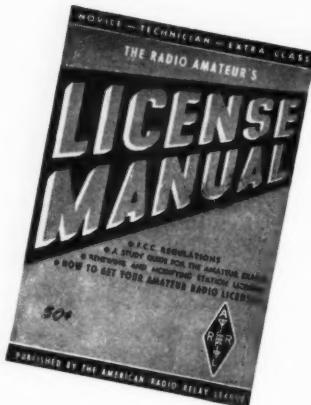
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and 13 — so start to clean up the harmonics in those rigs. See Phil Rand's TV Interference booklet for ways and means, as well as the many excellent articles in the past year or two in *QST*. The FCC is solidly behind the amateurs in defending him from unwarranted attack by TV viewers. But, above all, train yourself to be DIPLOMATIC for your coming investigations on TVI. Diplomacy is three-quarters of the battle. The Humboldt Amateur Radio Club meets the second and fourth Fridays in the YMCA rooms, rear of Municipal Auditorium, entrance on "E" St., Eureka, San Francisco Area: EC: BYS. Plans for the Pacific Division Convention, to be held July 4th, 5th, and 6th, are complete and an excellent time is promised to all by the sponsoring Central California Radio Council, and Larry Reed, chairman of the event. Pre-registration is \$6.00 to June 21st, and registration AFTER that date is \$7.50. Send all registrations to Harry Witake, secy., 1256 Masonic Ave., San Francisco. The SFRC meets the fourth Friday at the American Legion Hall, 1641 Taraval St., and the High Frequency Amateur Mobile Society meets the second Friday at 1625 Van Ness Ave. Traffic: W6UEV 256, ATO 7.

SACRAMENTO VALLEY — Acting SCM, Willie van de Kamp, W6CKV — JRY now holds Advanced Class licensee. PIV reports 2-meter activity with some DX. Sacramento radio clubs held a joint meeting for Ken Hughes, VRG was visitor in the Chico Area. SYN's XYL now has her own call, OKF. Marysville boasts WN6LGX. JDN has good luck with n.f.m. on 32V-2. The Mt. Shasta Radio Club had rig at the Hobby Show. AF is having noise limiter troubles. KFO got 1st-class radiotelephone license and a wife and now is awaiting discharge. The GERC provided radio communications for the Chico State College Pioneer Day Parade. The treasurer of the Sacramento Valley Radio Club is QKJ, not QKT as recently reported. ILZ has been mobile for a year and got Advanced Class license in October, 1951. Traffic: W6PIV 205, JDN 83, KFO 16.

ROANOKE DIVISION

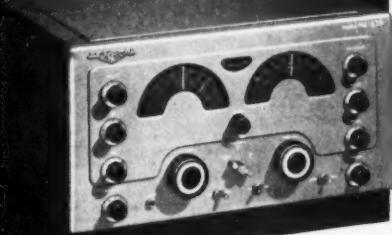
NORTH CAROLINA — SCM, J. C. Geaslen, W4DLX — This month adds another North Carolina name to the list of Silent Keys, that of R. E. Dawson, Jr., DSY, of Charlotte. Bob was known worldwide for his work on the DX bands. Congrats to Katherine SGD, on winning the YL-OM Contest. The Asheville Club has reorganized with AFM, pres.; MZS, vice-pres.; VG, treas.; and E. P. Echerda, secy. The Club has an active TVI Committee for the education of the TV lookers and servicemen; also classes for Novices and brush-ups for the old-timers. AKC reports that NCN closed down for the summer May 10th and hopes to see all the old members back fresh in September. The Tar Heel Net will continue throughout the summer months as usual. Let me remind the North Carolina gang to hold week-end gum-beatings a few kc. off 3865 kc. because our many mobiles like to get out on these nice week ends. One big home-station carrier can snow under all the mobiles. AKC, BDU, and DLX took part in the C.W. CD Party. REZ, CVQ, NYN, and DLX were active in the Phone CD Party. NYN won the last one. IPO, of Sanford, is home from Korea and back on 75 meters. Activity reports were low this month but with all these new proposals I guess you fellows are too worried to write. Let's keep the ARRL informed through our Division Director, CVQ, on how we feel about these recent proposals so that we don't come out on the short end of the stick. Traffic: W4AKC 213, RRH 138, IMH 135, BAW 56, BDU 42, PIC 40, DLX 19, CGL 15.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — A club has been formed in Spartanburg with the following officers: CPZ, pres.; NTO, vice-pres.; and Ralph Queen, secy.-treas. The club is planning ARRL affiliation. FM has worked 4X4PK for WAC after 30 years hamming. RXO is Class I Official Observer and had a feature article in May *CQ* on mobile rigs. DMX, DX, EDQ, FM, and MPR were appointed OPS during May. All ARRL members should submit application to the SCM for official station appointment. TWW and TWX have received their General Class tickets. WN4RFI is on 80 meters from Clinton. SUE is on all bands with a BC-610 from Fort Jackson. DCE has been transferred to Guana. SOD has 12 watts on 40 meters from Naval Base, S. C. 8GBD has moved to Charleston. IAKN was a visitor at the Naval Base Club. Ben Team, W4DX, 1304 Fair St., Camden, S. C., has accepted appointment as Section Emergency Coordinator for South Carolina and all ECs should report their activities to the SEC without delay. Traffic: W4ANK 480, THR 113, CHD 76, FM 18, EDQ 8.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Word has been passed down that the week-end period beginning Oct. 11th has been approved for the Roanoke Division Convention to be held at Richmond. The place is Hotel Jefferson. There will be plenty of timely technical talks and demonstrations. Formal announcements and programs will be issued later but in the meantime make plans to attend. Despite extremely poor conditions on most of the bands the 3rd Annual Virginia QSO Party brought out plenty of aspirants. C.W. was particularly troublesome on 40 meters with skip reigning throughout. (*Continued on page 98*)

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SNH reports TVI has been defeated after much prolonged agony. Questionnaires for TCC stations are out. Look them over seriously and fill out for immediate return to Headquarters if you can qualify. RVO skeds Guantanamo Bay, Cuba, Tues. and Fri. and makes a nice link to the newly-acquired arm to our traffic system permitted by recent FCC-State Dept. Decree. LW operated at NSS Annapolis Naval Academy on Armed Forces Day. SHJ again hits BPL for the third consecutive month, with FOR duplicating his last month's BPL on deliveries. Virginia Phone Net climaxed the season operations with its annual picnic and hamfest at the farm of NV near Palmyra. IYI had his first 21-Mc. contact with KV4AA. JAQ and his 75-meter mobile was active in Virginia. QSO Party hopping county lines for additional contacts. PWX drove 200 miles to Sky Line to surprise the gang with extra contacts on VFN frequency but couldn't squeeze in. PVRC is laying the ground work for a special mass meeting of all Novice licensees in the area with a view of indoctrination into the various phases of ham radio and the fields of interest that can be enjoyed with courses for hurdling the General Class. The men sparkling that program are KFC and CC. We regret to announce the passing of RTO. Sam was a sergeant in the Marines and participated in the first landing on Guadalcanal ten years ago. He had been confined to Veterans Hospital, Dayton, Ariz., following an auto accident last February. Traffic: W4SHJ 549, FOR 479, FV 129, FF 94, PXA 56, NV 52, JAQ 46, KX 46, SNH 25, CFV 24, NUU 23, IYI 18, OKN 15, RDJ 15, W3TT/4, 12, W4RVO 11, HQN 2, LW 2.

WEST VIRGINIA — SCM, John T. Steele, W8MCR — The Stonewall Jackson ARC exhibited the civil defense film "And a Voice shall be Heard" at its regular club meeting April 19th. Local defense officials and disaster chairman of the Red Cross were among the visitors. Some surprise was expressed at the preparedness of the city on which the film is based but it was well received and interesting. "March of Time" directed the production of the film under the supervision of General Electric Co. The Club meets the first and third Saturdays of each month and the members are active locally on 50 Mc. W8N1JM, now W8J1JM, got his WAS in the Hallucitators Contest. AUJ again made BPL. YPN has a new Viking. The Tri-City Club and KVARA co-sponsored a 10-meter emergency test run Sunday May 4th. Three fixed and six mobile stations were used. Mammie the mobiles were LII, CLX, QHG, DAR, ATF, and IJM, while the fixed stations were operated by ETF, HZH, and IAJ. Excellent results were reported. Traffic: W8AU 734, BWK 77, YPR 32, FUS 21, GEP 9.

ROCKY MOUNTAIN DIVISION

UTAH — SCM, Floyd L. Hinshaw, W7UTM — Flood Patrol activities preclude sending reports this month. It is known that JVA has been Acting Net Control Station for 10-meter patrol of flooded sections of the Salt Lake City Area, and further news will be reported after the emergency passes. UTM has been practically inactive this month because of work QRM caused by illnesses in his office. Traffic: W7UTM 252.

WYOMING — SCM, A. D. Gaddis, W7HNI — The YO Net affords a practical means for handling traffic in Wyoming. Check in on 3622.5 kc. — we need your help. PKX makes BPL. A good job well done. Wally! OZK is the new EC for Cheyenne. GZG is helping on the net. AEC is planning an egg-throwing contest for the hamfest. Watch out, Margaret! Lloyd Michaels is new president of the Laramie Club. KFV has new 75-ft. vertical. ROK has received his ticket. Congrats, OM. The Casper gang reports plans for the biggest and best hamfest are near completion. It should be the event of the summer with contests and prizes galore, so don't miss it. Traffic: W7PKX 527, K7FAO 89, W7HNI 16, GZG 11.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Dr. Arthur W. Woods, W4GJW — ATF and AUP claim first occupancy of the 21-Mc. band in Alabama at the stroke of 2:00 a.m. May 1st. BFM meets AENP, AENB, and 3 MARS nets in addition to the Tennessee Net. DID now is using 810s in the final and feeds antenna with coax. DXB meets AENP reliably. HFP says it's 50-50 traffic and ragchewing at his shack. KNW meets AENP and AENR regularly. MVM, now in Birmingham, meets AENB and RN5, and also MARS Net, besides scoring 4965 in the CD Party. Another regular is PPK, who calls in on AENP, AENB, and AENR. RTI reports that W4VSF passed her General Class exam two days after receiving her Novice ticket. Traffic: W4HFP 56, BFM 48, KNW 38, MVM 22, DXB 12, RTI 11, DID 8, GJW 8, PPK 8.

EASTERN FLORIDA — SCM, John W. Hollister, Jr., W4FWZ — The passing of DU is recorded here in deepest sorrow. The memorial service for Doc by the K. of K. Net is worthy of mention. Recent ARRL appointments: SHG as EC, OVO as EC, AWY as EC, AKF as OO, TRA as ORS and OO, TRP as OBS and OO, TVQ as OO. Here is the Novice net information: TRA and a group of Novices

(Continued on page 100)

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Covers 75, 20 and 10 meters. Stages: 12AT7 grounded grid R. F., B. F. O., 6UB 2-6CB6 I. F. stages (6.7kc); 6ALS 2det., N. L., 6AT6 audio; 6AQ5 audio (4.5 watts); OB2 voltage regulator. Sensitivity: 1 microvolt. A. N. L. and B.F.O. push button operated. Requires 250 volts at 80 Ma. D. C. Supplied with tubes, but less power supply and speaker.

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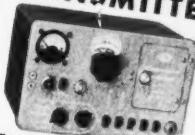


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have it going! Net call is FNN. WN4TYI reports these Tech. Class calls: UKL, UCZ, WN4TYI, WN4UNW, WN4VPB, WN4VPC. Clewiston: It's BPL for PJU with a total of 1204. Grattan reports that 504 out of 599 received were overseas messages. Coral Gables: TRA, 13 years old, is one of our youngest ORS. Deland: PJI has been MO'ing the K. of KC. Net from around the State such as at LJM and AYX. Ft. Lauderdale: The April 7th Red Cross alert was tops and showed the AREC to good advantage. New Club officials: MLS, FNR, QBY, CON, JVFC, LTG, ex-UP, and IM. Jacksonville: HWA, with a couple of CQs on 21 Mc., latched a ZL. JGD got some nice publicity for Florida and ham radio in the local press doing a good turn for VE1K. Lakeland: NAK and the AREC are having regular drills. Miami: SAT ran up 10,800 points in the April CD Party with 5.4 watts. Orlando: TVQ reports the N dropped from the following, who passed Class B exam: TVQ, TVS, UHE, UHD, UGT, TKD, TFP, and THX. TVQ's dad, AWS, passed Extra Class exam. TVQ built new rig and an electronic key. Winter Garden: SVX says he and TAS, TJU, and SW are trying to start a rag-chewer's net on 7250 kc. each Sunday at 3 p.m. West Palm Beach: RTX was elected mayor at Haverhill. Rebel Club members in contests: WN4UGD and UGT (now minus the N) were high for the section in the Novice Roundup. CRK was section high in the April CD Party. The glass-arm BRB was high in the 4th call area for 'phone in the CD Party. Traffic: WAPJU 1204, PZT 244, FPC 226, DRD 188, LMT 74, KJ 68, TRA 62, HWA 45, OMN 38, FJC 34, ALP 27, FWZ 27, IOW 27, RWM 18, DM 14, NAK 9, SIZ 9, TYE 9, DES 8, IYT 7, NRT 7, TVQ 7, TKD 5, RT 4.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PQW, EC: PAA, has a new Extra First-Class ham ticket. VCB and UTB are now General Class and are awaiting a new 32V-3. 9CGO/4 is in our midst and is a 6-meter man. UCY continues to be the DX man. FHQ keeps things going on 28 Mc. PTK and TTM had their ECO reworked by NAB. The EARS Hamfest was an FB outing. RJR won the left-foot sending contest. VMV is building a big rig. SZH is doing likewise. PQW has been mobile in W5-Land. DXQ is looking at high power. DAO wants HRO. RZV keeps 75 meters hot. AXP is rebuilding. NYZ is going mobile. MS is dreaming of s.a.b. rig and working 6 meters. ISW joins the gang on 20-meter phone. QK is contemplating 20-meter phone. RFD works 10 meters late at night. NN and AGB are doing an FB job on 75 meters. Traffic: WAAXP 3, MS 2.

GEORGIA — SCM, James P. Born, Jr., W4ZD — The Georgia Cracker Radio Club's Hamfest will be held Aug. 3rd at Dixon's Lodge on U. S. Highway 80 at Lizella, Ga., which is 12 miles from Macon. Tickets may be obtained by contacting NS, the Club's secretary, 129 North Chandler Street, Decatur, Ga. TVN has a new mobile rig on 28 Mc., also a new 28-Mc. wide-spaced beam. TGO now has his General Class license and a new 28-Mc. mobile transmitter. GVU has a new 32V-3 Collins. MTS is building a vertical antenna for 7 Mc. OSE, our Route Manager, is doing an FB job with the Brass Pounders Net. The Camp Gordon Radio Club made all the members of the Amateur Radio Club of Augusta honorary members of their club. HYW has returned to the air with a Collins 31OB-1 exciter and a 300-watt p.p. 4-65A final on all bands. K4WAR has a new 14-Mc. beam. VTA is the new call of the Confederate Signal Corps of Atlanta. EJC is building a 200-watt 'phone rig for the South Atlanta c.d. control center. POI has returned to Atlanta after a visit to KP4 and KV4-Land. The new call of the Kennebogee Radio Club of Marietta is BTI. PFA has moved from Macon to Atlanta and has a new 1-kw. 3.85-Mc. 'phone rig. EWN is moving to Baltimore, Md. The Macon Radio Club has a new call, BKM; also a new 400-watt all-band 'phone and e.w. rig. HZG returned to Atlanta from Miami for a visit with FBH, MTS, and ZD. Traffic: K4WAR 1463, 9W4OSE 179, EJC 45, POI 35, ZD 29, MTS 20, HYW 6, TVN 6.

WEST INDIES — SCM, William Werner, KP4DJ — SEC: ES, CP, a new OBS, will broadcast ARRL bulletins on 3925 kc. Mon., Tues., Wed., Thurs., and Sun., 8 p.m. AST. A new 10-meter net is flourishing, with AQ, DJ, DU, IO, LX, OO, PD, PW, NL, HZ, FS, LC, and RA reporting to NCS CY each Friday at 8 p.m. on 28.8 Mc. KP4ID, installed on the main floor of the Red Cross Building in San Juan, uses 400 watts on 3925 kc., is NCS for AREC nets and soon will operate 28.8 Mc., 3925 kc., and 3559 kc. simultaneously using 3-kw. emergency power plant. UW renewed ORS appointment. NO has been appointed Assistant Director MARS. ZK is a member of the Old Old-Timers Club, having been continuously licensed for 40 years. WP4RK now is KP4RK. W4NRW/KP4 now is KP4SK. W4CG/KV4, now KV4BB, has a kw. on 75 meters. DV has 10-meter mobile and is adding 200 watts for 20/75 with 12-volt supply in the station wagon. CG, GN, IO, LX, MQ, PD, and PT joined the AREC. Traffic: KP4DV 7, DJ 6.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — An all-YL AREC net held its first drill in April, covering the entire Isthmus in a simulated daytime emergency in which the OMs were presumed to be away at work. SEC was NCS to get the gals started, but they gave him a bad

(Continued on page 102)

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Mallard Hi-Q Loading Coils

 <p>Hi-Q 20 loading coil for 20 meter band. Plated $\frac{1}{8}$" copper wire. Weatherproof plexiglas housing. Provision for exact inductance adjustment. Sturdy, efficient. Amateur Net. \$8.95</p>	 <p>Hi-Q 75 loading coil for 75 meter band. Two pie-wound coils for greatest efficiency. Plexiglas housing and Insulex-treated copper wire to resist moisture and fungus and maintain high Q. Easily installed, adjusted to exact inductance. Amateur Net. \$7.95</p>
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New! Hi-Q 10 & 160 Meter Loading Coils

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Hi-Q160 for 96" whip, three pie-wound coils, same construction as Hi-Q75. **Amateur Net.** \$8.95

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Models 10N, 20N, 75N. **Amateur Net.** \$39.95

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time right from the beginning when they came back using the proposed and strange-sounding NATO phonetics which they had all taken the trouble to memorize. In the net were, as they called themselves, Kilo Zulu Fives, Alpha Coco, Bravo Metro, Coco Nectar, Delta Golf, Golf Queen, Kilo Alpha, Lima Metro, Metro Lima, and Nectar Nectar. Net procedure by the YLs was perfect and messages were all in proper ARRL form. WZ was the first man on 21 Mc. RV is Acting PAM and CZARA activities manager while PC is Stateside. FL built a neat vacuum tube-keyer. EE, LL, and LP are latest members of the Monday night AREC net.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Samuel A. Greenlee, W6ESR — L SEC: KSX, PAM; PIB, RM: FWY, GJP. Section Traffic Nets: L. A. Section Net (LSN), Mon. through Fri. c.w. 3600 kc. at 2130 (note new time). El Capitan Net (ECN), 3655 kc. at 1930. BPL this month was made by HK, KYV, GYH, NCP, GKM/6, and GJP. The section is going all-out in an endeavor to eliminate origination of the "junk" type of message. In our opinion, our services can be evaluated in a higher bracket than that value placed upon us when we solicit or are requested to handle message that should properly go by a 2¢ postcard. In addition, the nets within the section are taking a dim view of traffic that seems to arrive by mule train. BLY reports: MYJ was guest of the Radio 50 Club; ISQ, HAM, and NXJ are new members; LVQ now is Class A; and CEA and FAI were back in W9-Land, digging out snowbound trains (they're diesel specialists). KLY is really in the traffic game. PMS is recovering from an operation. Daytime traffic? Break MCAN-4 after 11:00 PDST (3905 kc.). Extra! CMN is mobile ('phone, yet). CK asks how come off-frequency, etc., operators don't seem to be in the *Callbook*. One for the revolvers, Pappy? DTY finally did it! He changed jobs to be on the bands more. OHX is graduating from H. S. IZO got a new Viking. FMG (mgr. of LSM) reports WPF has an OT certificate from 1967! COF now is mobile on all bands. KYV gets his traffic the hard way, on a dead band. KSX is completing a swing around LAX emergency nets. PIB finally licked Virus X. A new traffic man on ECN-LSN, HJK, age 12 (good, too), says a new club is starting in WLA. HK got himself a bass thaata long! WN6NJU is coaching a friend for the WN exam. Besides a jillion skeds, GYH liaisons for MARS. The Long Beach Club had a ham-booth at the L. B. Hobby Show, with GKM as bossman. Noticed DDE lately? The guy is everywhere there is a net. GJP says it's certainly a pleasure to listen to LSN since FMG took over; a hot net if there ever was one. FWY reports WN6OJX is a young'un who operates like an old-timer. LZS has a new mobile. YLCR news, per CEE, president: WSV is the proud mama of a new jr. operator. WNs CQV and OBZ are mother and daughter. They and AVF, KER, MFP, and NLM were among those at the April meeting. KQS is on 15, as is BHIG, who worked the world including a VK on opening day. JXF is M/M with 50 watts. NJV is on 10. GEB reminds us that CUF made a record score in the SS Contest; two of his "students" have their WN tickets and two are coming up. Thanks also to BUK, CFL, EBK, EPL, LDR, PIB, WOO, and YSK for reports. MU asks "wha-happen to 10? NCP reports a goodie: He was asked by HQX and HK to help get a medical priority message into Lawton, Okla., had just been monitoring a W5 on MARS, broke him and found his QTH as Lawton. The message consumed a matter of minutes from JA-Land and possibly saved a life! FKH (his son, 11, is WN6IHM) has snappy remote control job. AREC notes per KSX, SEC: He regrets the resignation of VMW, COZ, and ZGZ. They did a grand job. New ECs: SW (Mt. Baldy); NSX (Long Beach); and VCU, back in harness for Glen-Area. He's mighty proud, sub, of his boys. Traffic: W6HK 3315, KYV 3005, GYH 1720, NCP 900, GKM/6 759, GJP 358, DDE/FAE 281, FMG 252, HLZ 106, BLY 100, HOV 99, KOY 85, PMS 75, BHG 72, CMN 74, CK 54, GEB 52, OHX 47, IZO 29, COF 20, FWY 17, KSX 16, PIB 11, DTY 2, HJK 2, WN6NJU 2.

ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — This is your new SCM's first activities report. PLM has new GP antenna on 10 meters. PEF, daughter of PLM, got her Adv. Cl.; KOY, XYL of MAE, got her Gen. Cl.; MID got his Ex. Cl.; and NYK got 3rd-class phone license. QAP is in Nicksville. JGZ, MLL, and PKU had good scores in the last CD Party. Tucson expects to have the Meade W. Powell Memorial Station, GV, in operation in the new Red Cross Building in October. NYK, Tucson EC, reports a c.d. station is being established, and advises Emergency Manuals are available to anyone upon request. The 6-meter gang in Tucson is composed of FGG, HUV, LFX, LLO, LVR, NVN, NYK, OFA, OXN, and TXM, is looking for DX around the State. Also on 2 meters are PFG, LVR, NVN, and UPF. Anyone on these bands, please report your activities. LJV and LSK are on 2 meters. We regret the passing of THJ on March 20th. All present appointments will remain "as is." Watch expiration dates and send in for endorsement. Additional appointments for RM, OO, OBS, OES, OPS, and ORS are available to anyone interested.

(Continued on page 104)

NEWS FLASH FROM HARRISON HAM HEADQUARTERS

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MM4	52 ohms	2-500	44.50
MM5	72 ohms	2-500	44.50

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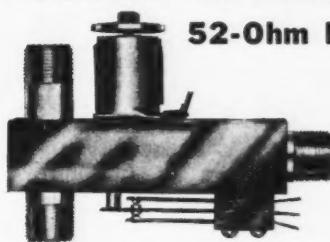
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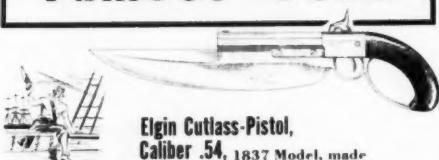


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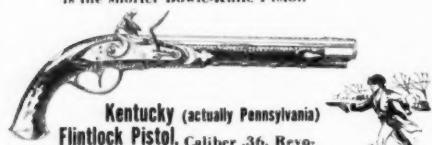
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Send reports and information for this column promptly after the 1st of each month. Traffic: W7OXN 38, LVR 4.

SAN DIEGO — SCM, Mrs. Ellen White, W6YYM — Asst. SCMs: Shelley E. Trotter, 6BAM; Richard E. Hudleston, 6DLB; Thomas H. Wells, 6EWU. RM: IZG, ECs: IOK and DEY. The largest monthly traffic yet to be submitted to your SCM was run up by HQX, of Camp Pendleton, for a total of 6645 April traffic. TET, GTC, and IZG received their first BRAT certificates for April traffic. New to SSN and due for appointment as ORS is NIC of Newport Beach. TZB's new harmonic is competing with ham radio for attention these days. The Orange County Radio Club's class in theory and code is snowed under with applications! HJG has dropped the "N" from his call and is sporting a 10-meter mobile rig. A new YL in the SD YLRL, WN4UDM/6, is waiting for her new W6 call. Convention plans are hopping in the San Diego Area. The Southwestern Division ARRL Convention will be held locally in Balboa Park in October. For further dope, contact convention chairman, YXM. The YLRL 80 c.w. net plans to use 3735 kc. for its permanent net frequency, net meeting 9:00 P.M. PDT Wednesdays nights. GMG is presenting JA2ES, Mt. Fuji, Japan, and hopes to be back in San Diego some time during this summer. DEY is planning construction of a 32 ft. by 16 ft. ham shack in the near future. The section soon will lose K6CN to W4-Land. It'd like readers of this column to seriously think of applicants for the post of SCM. My term is up in October, so get going and pick applicants for the post. For details on applications, consult QST. Traffic: W6HQX 6645, BAM 765, ELQ 336, IZG 306, GTC 83.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, William A. Green, W5BKH — Asst. SCM, Joe G. Buch, 5CDU. SEC: JQD. RM: QHI. PAM: IWQ. ETARC, under the guidance of RHC and LGY, entertained about 400 people at the Commerce annual picnic. ARK, EC for Fort Worth, had an excellent exhibit at the Alert America Show in that city with much traffic handled. During the visit of the same convoy to Dallas, ham radio unwittingly stole the show with its booth. Working under the direction of LEZ were the Grand Prairie ARC, the Caravan Club, and the Dallas ARC. Thanks to radio WRR for the publicity program. Our SEC met with the Lamesa ARC where c.d. plans were worked out with the police and the Chamber of Commerce. Traffic still is holding at a high level with 27 stations setting a record for this section. Super delivery was given by KPB, which drove 120 miles to deliver a message. NTX now is meeting every night on 3760 kc. at 1900 with a band width of OHY on 3099 kc. with a pair of 4-125As in single sideband, the first in this section. New equipment department: TVU has a 75-watt rig. TLW has an all-band 150-watt amplifier and modulator. SQW/VRX has a new call. LEN has that Extra Class ticket. UXV made a W6 contact with his first traffic. Traffic: W5QHI 1169, BKH 436, PAK 272, ARK 197, JOG 180, UTV 151, SQW 119, QMF 81, SNX 79, LEZ 56, IWQ 48, TLW 47, KPB 40, RRM 36, PXI 30, CWE 28, PCN 26, ASA 25, SGR 20, RHP 19, GHZ 18, UFD 18, SRQ 12, PVQ 8, OHY 7, UXV 5, TU 2.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: OQD. PAMs: GZK and ATJ. The Tulsa Radio Club held a very successful picnic at Lake Claremore Sunday, May 4th, with a total attendance of 95, ten coming from Kansas for the event. Twenty-one mobiles were at the lake. EHSC spent most of the month of April in Texas. LXN now holds an Extra Class license. UEFH has new General Class license. UZG is a new resident of Oklahoma City. RIT is working on new shack. The Easter Pageant traffic from the Lawton Area was light compared to other years because of rainy, cold weather but was handled in good shape and all cleared by Sunday evening. OLZ will meet informally from May 31st until Sept. 2nd when the regular schedule will be resumed. OQD will vacation in California. FME is back from Korea and at home in Enid. The Southwest Amateur Radio Club meets the first Monday of each month at the City Hall in Fredrik. Club call is UVX. HDN is the president, with OZE vice-president. Skip has wrecked SW's schedules. BDX now is operating single sideband. FOM has 144-Mc. antenna and soon will be active on that band. SNL and SNM are engaged in a new business. OQB has moved to Cherokee. Traffic: W5MRK 525, FOG 430, FOM 301, WIRJD/5 234, WSGZK 214, QVV 214, OQD 160, JHA 137, MFX 125, VHY 118, RIT 115, MQI 93, KY 62, FKL 60, GVV 55, CKQ 25, LXH 24, ESB 11, HFN 10, SWJ 10.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — RN5 meets on 3645 kc. Mon. through Fri. at 2000 CST. SJA is helping PDE get Class B and A tickets. CVQ is active at U. of T. ACL is experimenting. The Novice emergency net of Texas, sponsored by the Texas State Guard, is doing nicely on 3726 kc. The Odessa Radio Club now is affiliated with ARRL. SJA reports RJV got 1st-class commercial ticket. STG is at U. of T. with FB TVI-proof 10-meter mobile. QPL operates a TV shop in Conroe. WN5TWB gets up at 3 A.M. to work DX. QJD, his XYL RTT, and son SIB, are one of the most active ham families in East Texas. NHB is active on CERN and HEN and looking for 110-volt 60-cycle emergency plant. ULN now

(Continued on page 106)

"PICON"

There's a short but potent sentence in the Communications Act of 1934, as amended, which reads:

The [Federal Communications] Commission, if public interest, convenience or necessity will be served thereby, subject to the limitations of this Act, shall grant to any applicant therefor a station license provided for by this Act.

Thus the fate of an application for a new broadcast station, for example, may depend entirely upon the applicant's ability to demonstrate that his proposed station will operate in the "public interest, convenience or necessity." The phrase is so often used in Washington that it is sometimes shortened to "picon."

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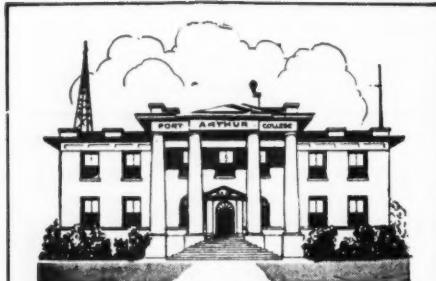
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has a total of 19 states worked. His XYL is WN5VNL. WN5URW/5 is very active on 80-meter c.w. RIH is clamp-tube modulating 696 with 100 watts. RSJ and ADZ opened 15 meters at 0139.9 May 1st, each with 1 kw., but heard no one else. BZO is really turning out an FB mobile antenna. EYV is working 1A and 6s on 21 Mc. The Texas State Guard is sponsoring a Novice club in the Woodsboro and Refugio Area. TSG is furnishing ham shack and equipment. Membership includes WN5LUD, WN5UYX, WN5VIQ, WN5VPC, WN5VPP, and WN5VSP. The club is spearheaded by EYV. LS gave a swell program to the HARC on electronic voltage regulators. JYM has a new 400-watt rig on 75, 40, and 80 meters. MDZ is working on new 75 meter mobile rig. LSE now is on 75-meter mobile and is working on 1 kw. rig. DUG is helping Hank Schreiber to get back on after many years. LLT is helping others to clear up their TVL. ADZ says the 14-Mc. beam works well on 21 Mc. but in reverse direction. RPW has 300-watt TVI-proof rig on all bands. LS is on 40-meter c.w. with at least 1 kw. NN also is running 1 kw. on 40 and 75 meters. TNR is building new 150-watt final for 10 and 80 meters. WN5VHR gets lots of QSLs. HPB soon will be active on 2 and 80 meters. LGF is active on 2 and 40 meters. PFB is heard from 2 to 160 with an FB signal. QZG has gone mobile. QJS reports 12 finished the first 12-week course of c.d. training. NZX is heard on 144 Mc. OPP and RWB have ham shack together and work lots of 20-meter c.w. DX. SDA is on 75, 20, and 10-meter phone with three-element wide-spaced beam. LLU has burned up VFO so he is rock-bound on 10-20-meter phone. BHO recently addressed the Bayshore Radio Club. UQX is going to 120 watts on 20, 40, and 80 meters. RSA is all set with emergency equipment. STG is at U. of T. on all bands and mobile. RVE is set up on all bands with fixed-emergency and mobile. UQG is active with rigs for all bands. DSB is new OES. NDX reports WN5TYI has mobile on 2726 kc. Texas State Guard frequency. HMO is a newcomer to Alice. PTV still is making with the traffic-handling. Traffic: W5MN 706, W4RZU/5 155, W5RIH 87, FJF 31, NIY 3, NPX 1.

NEW MEXICO — SCM, Robert W. Freymann, WN5NZE — The State emergency drill was held Apr. 27th. The Los Alamos group had 12 stations active in Espanola Valley. State nets on 3633 and 3838 kc. and MARS were saturated by messages from field stations. Santa Fe operated on 75, 80, 6, and 2 meters. Albuquerque to Santa Fe was worked S9 on 2 meters. NFU is out of the hospital and back on 2 meters. LFH, MYQ, KCW, and NFU are active in Albuquerque-Santa Fe-Los Alamos-2-meter net. FKP, KWP, and KCW are going strong on 6 meters. RWH is using a kite antenna for effective coverage of the State using low power on 4 Mc. SPM, new Class A, has 26 states toward WAS with 20 watts on 7 Mc. LEF is new OO. JZT is working on new VFO. UVA is mobile on 75 meters. New Novices are WN5VES, in Zuni; WN5VRC, in Las Vegas. GGO has a new jr. operator. New clubs have been organized in Pecos and Tularosa Valleys. Extra Class tickets: CA, CTG, LEF, MUK, and NXE. RLL and UKZ, OM-XLY, are on 80 meters from Socorro. PLK has a new 32V-2 and Morrow 3-band converter. MYM is completing 300-watt phone-c.w. rig. OBZ and UZC now are with CAA in Las Vegas. Traffic: W5IGO 237, NKG 153, NXE 94, ZU 54, JZT 47, PLK 44, RMH 40, NJR 34, LNG 32, RMU 23, SPM 18, NZT 16, MYQ 10, DWB 8, UVA 8, PSV 6, PDO 2.

CANADA MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ, RM, OM, EC: EK. Recent visitors to the Halifax gang were DL1XB and WSAI. The former previously had QSOed OM and was his guest while here en route to Montreal. The latter was the guest of FQ, who still is local "Northern Messenger" for all points north. "When 14 Mc. is open" SI is the newest 3.8-Mc. mobile and uses an ATR-5 in his station wagon. Welcome back to OC, who returns after a long illness. We expect to hear VE3EV, ex-EP and VO6EP, on soon from Yellowknife, N.W.T., with a VE8 or fixed portable VE4. Active now on 3.8-Mc. mobile in this area are BC, DQ, ET, FQ, GL, AW, and PT. JD now is Official Observer. WL has his OES appointment. EK says things are not too good in BERU tests. DB got his DXCC at last but says P5J was disallowed. HI! KM, HC, PT, and LZ handled traffic during the Air Show at H.M.C.S. *Shearwater*. HC has been quite active on 3.5-Mc. c.w. because of a landlord who has BCI. We hear via the grapevine that OM, our RM, and WL, our OES, officially opened the 21-Mc. band in the VE1 section. Traffic: (Apr.) VE1FQ 131, YV 92, MK 57, AL 48, AAK 27, ZO 23, ABR 13, ABJ 12, XH 11, JH 10, DB 9, FR 6, ZM 6, PS 5, AAL 4, AAN 2, JL 2. (Mar.) VE1FQ 120.

ONTARIO DIVISION

ONTARIO — SCM, G. Eric Farquhar, VE3IA — Now located in Ottawa and looking for 14-Mc. contacts is Bill Stephen, ex-2LC, 3AD, now 3NM. BUR reports the following reporters on the Ontario section net: ATR, BBM, BL, BME, BMG, BOZ, BVR, BXX, DGA, DHV, DC. (Continued on page 108)



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Interested personnel are requested to write a brief application letter to Box 1136, Main Postoffice, Washington, D. C. Considerable duplication of effort will be avoided if the following outline is adhered to:

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EAM, EAU, GI, SG, and WY. Toronto's simulated emergency test of April, under the capable leadership of IL, was well attended and successful. The Ontario 'Phone Net on 3765 kc. continues to be a popular outlet. TRN operates on Eastern Standard Time on 3675 kc. A hearty welcome to DPX, a newcomer in Kincardine. VD reports he is almost surrounded by plumber's delights now. BLY tried out nine-watter while home for the Easter holidays. DFE and MW are heard on AFARS. Though away from home quite a bit, BPE returns for LO-NITES. OJ confines his activities to 50 Mc. CJ, well-known as VP5BP, spoke to large audiences at meetings of the Hamilton Amateur Radio Club and the Nortown Club of Toronto on his second expedition to the Cayman Islands. BOF tried out 21-Mc. folded dipole. Welcome to Hamilton. BJR ex-4EA. BIK is doing fine job with code classes. Reconstruction and wiring of BBV shack kept Wes occupied. GBT has returned to AFARS Net. Home from Florida are DND and WY. XBK keeps an eye on new beam. The Oshawa Hamfest went over with a bang. BJV does a nice job editing the Nortown Club bulletin. AJR with her mobile, enjoys Southern Ontario highways. The Ontario 'Phone Club picnic will be held on July 6th at Queens Park, Stratford. Keep an ear to the mobile transmissions for details. Direct news from you fellows would be appreciated. Page 6 this issue gives the QTH. Traffic: (Apr.) VE3ATR 185, BUR 120, JI 72, GI 50, EAM 39, IA 38, BMG 35, WY 25, PH 23, EAU 15, BPE 3, DFE 2, OJ 2. (Mar.) VE3BER 33, BUS 22, PH 14, VD 6.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — HW, whose usual hang-out is on 40 meters, has been giving 80-meter c.w. a whirl and renewing old acquaintances on that band. CA reports very little traffic and several skeds with the North Country missed because of poor conditions, and claims the first VE2 QSO on the new 21-Mc. band, working VE2II at 12:01 A.M. May 1st. VP2GG and GI3DZE visited CA. AHY is rebuilding the rig with a pair of 813s for 28 Mc. AHY and DH are AEC in their respective districts. ANC is building a 10-meter rig with an 813, and at present is on all bands c.w. and 144-Mc. 'phone. EY is building a 10-meter converter so he can participate in c.d. exercises. KG transmits ARRL bulletins each night at 1930 on 28,440 kc. and Saturdays and Sundays at 1300 on 28,550 kc. He has a 10-meter beam on top of a 50-ft. tower with a five-element 144-Mc. beam stacked on the 10-meter beam. Champlain County-Lapararie Section AREC held its first c.d. course in the St. Lambert Fire Station April 29th, with an attendance of 26 out of 35 enrolled members. AIO is quitting h.f. for 420 Mc. and is making good progress on his new receiver. WW has worked 6 countries and NI 10 countries on the new 21-Mc. band. WA claims 101 countries confirmed. YN is ex-VE3AGG and is on 75, 40, and 20 meters with HF200 in the final at 200 watts, reactance modulated for the 'phone bands. AMB is on 75-meter 'phone with 6L6 30 watts modulated with a pair of 807s. Traffic: VE2CA 24, GL 14.

VANALTA DIVISION

BRITISH COLUMBIA — SCM, Wilf Moorhouse, VE7US — The VARC held a dance which was well accepted and many prizes were won. AMP is on in Alberni. Tyee Club news is expected soon. QC has an excellent traffic total and is quite busy with his net work. He has 150 watts now. AMJ is active but nothing startling; he also is busy giving c.w. practice. AEW is interested in AREC. ACW is on 75 meters from Victoria. AOB is on with 350-plus watts finally. US discarded 833A and went back to 810s at home station. ASA QSYs to 80 meters for skeds on c.w. UT (LG) QSYs to Estevan. ZT now is in VE4-Land for DOT. Mobiles in use in B.C. are becoming more active for the summer. DD has been reappointed as SEC for another year. Alberni DARC has been reorganized with 25 members and should produce results. AFO-DD mobiles are having QSOs daily across lunch-tables. YI/M is active on AREC again. A new ham for the lower Fraser Valley is AQH. AQS is back on dry land and running 2 watts. SH finally broke the silence with 15 watts input. Parksville is at last on the air — JI. DH can always be counted on for contact on 3755 kc. US again is mobiling in the interior of B.C. Traffic: VE7QC 96, YT 17, DH 9, AOB 6, AMJ 3, CX 2.

PRAIRIE DIVISION

SASKATCHEWAN — SCM, Harold B. Horn, VE5HR — SEC: BZ, PAM: JW, RM: TE. Activity has been low this month and so were reports. 50 Mc. is taking an upward swing with quite a number of the boys giving it a try. The Moose Jaw gang, CO, HB, OM, AR, NC are on every Sunday at 1300, as are EE and JE at Saskatoon. The Yorkton gang also is getting organized on that band. JK reports hearing signals on 50 Mc. but no DX. QL has a four-element rotary wide-spaced beam and converter working and is station on transmitter next. JF now is OES. LY also is CHJ48 on AFARS. UO has new Commander receiver. The Moose Jaw Club now has a station with the call MA. HR got in on LO-NITE but the band was poor

(Continued on page 110)

HARVEY HAS THE MOST COMPLETE STOCK OF MOBILE GEAR

SONAR MOBILE Rcvr. Model MR-3

Complete coverage for 10-11-20-75 meters. 8 tubes. 4.5 watts audio output. Uses: 12AT7 RF stage and B.F.O.

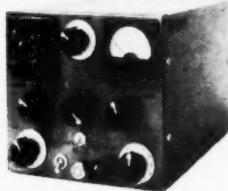
12AT7 oscillator mixer
(2) 6CB6 I.F. stages
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6AT6 1st audio
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1 Microvolt signal produces 0.5 Watt audio output. A.N.L. and B.F.O. are push-button operated.



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Complete with tubes . . . less power supply and speaker..... \$89.95

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AMPLIFIER INPUT: Up to 60 watts 100% modulated, 30 watts input at 300 volts.

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ELMAC-A54 Under-dash Mobile Xmtr.

Measures: 7½" x 7½" x 12"
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The LN series converters are identical to the standard 2BR and 3BR converters, less the noise limiters.

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High quality, emergency band FM receivers for all applications. Brings in police calls, fire alarms, bus dispatchers, rail communications, etc.

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6 volt mobile \$72.50

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Model AR-2 (108 mc to 132 mc)
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Model SR-9 Receiver. A 9-tube superhet with built-in automatic noise limiter, voltage-regulated oscillator, and slide-rule dial. Sensitivity better than .5 microvolt. Size: 4-9/16" x 5-3/16" x 5-11/16". **\$72.45**

Model MB-26 Transmitter. 6-watt output . . . 6 standard tubes. Built-in antenna relay with connectors for power and antenna. Size: 6½" x 7" x 5¾". **\$72.45**

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SPECIAL

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7500 VDCW oil-
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.05 mfd 2500 VDC GE oil filled condenser.... **75¢**
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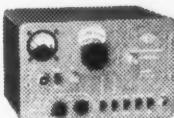
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\$47.60**

10-11, 15, 20 and 75 meters

**THE NEW
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\$124.50**



Frequency range 1.5 to 54 mc.

New Gonset "Scout" Converters Single
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Gonset Noise Clipper **9.25**

SPECIAL

110 Volts AC from 6 Volts DC. Terado
Converter Supplies 45 watts 110 VAC
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35W4, 12AT6), cord, plug and
50 feet of hookup wire. For 110V.
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ASTATIC

D-104 MICROPHONE

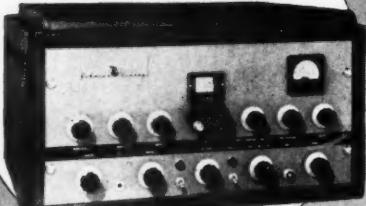
OLDTIMERS or newcomers—it makes no difference in the matter of microphone preference among Hams. Now, as for many years, an overwhelming majority prefer and use the famous Astatic Model D-104. Outstanding performance features are high output level (approx. -45 db) and definitely reduced R.F. feedback tendencies. A model employing ceramic element, with performance comparable to the crystal unit except for slightly lower output, is also available. If you would like complete details on the D-104 or other Astatic Mikes, please write.

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WASECA, MINNESOTA

144-Mc. Amplifier

(Continued from page 15)

800 watts on c.w. These levels represent a lot more power than we need most of the time on 2, however, so the 4-125As are usually loafing along at 200 to 300 watts input, with everything running a comfortable black.

In general, the manufacturer's typical operating conditions may be followed closely with excellent results. There is one slight variation that appears helpful: there is always a tendency for v.h.f. rigs to draw excessive plate current, and we have found it possible to run high values of plate current at relatively low plate voltages effectively with these tubes. They take 600 watts input with a 1500-volt plate supply beautifully, by running the screen voltage somewhat above the typical value of 350. With the heavy plate loading, there is a lower-than-average screen dissipation, and everything runs nicely. Flipping one switch drops the screen voltage to 300 and the final plate voltage to 800. The input with the same loading is then around 200 watts, which still makes an impressive 2-meter signal.

And what about TVI? Well, it varied with different receivers, but there was no r.f. interference that could not be cured readily enough. For test purposes, we have a system whereby a typical "fringe area" signal can be put into the receiver on any channel from 2 through 13, and this rig was operated in conjunction with nine different receivers on each of these channels. There was a very slight pattern on some of the receivers having 21-Mc. i.f. systems, apparently the result of 24-Mc. output from the oscillator stage of the exciter. Receivers having 45-Mc. i.f.s showed a similar pattern from the 48-Mc. stage in the exciter. These patterns had nothing to do with radiation from the final stage, and thus were independent of power or antenna location.

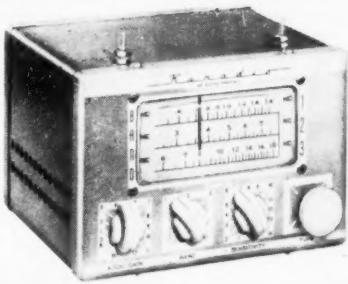
There was image TVI on Channel 2 in one receiver, and the tripler passed some energy on 192 as well as 144 Mc. There was some 192-Mc. pattern from the 48-Mc. exciter stage (4×48 Mc.), and it increased as the three stages in the transmitter were turned on individually, causing fairly bad interference in Channel 9. This same sort of thing develops in Channel 10 as the frequency is raised much above the low end of the band. The cure here is the same as for any harmonic trouble, except that it should be easier in this case, the trouble having been caused in the low-level stages. The transmitter is designed so that shielding can be added, and a low-pass filter, details of which will appear in *QST* at a later date, can then be inserted in the antenna circuit to get rid of the 192-Mc. radiation.

There was no interference from the 144-Mc. radiation from the transmitter on eight of nine receivers checked on all channels, 2 through 13. We feel safe in saying that, if you have TVI with a 2-meter rig, it is probably the result of trouble in the lower-frequency stages, or it is audio pick-up that is present only with amplitude modulation.

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3-BAND RADIO



KARADIO MODEL 80-C, 3-band mobile receiver for under-dash mounting. Covers broadcast band 540-1650 KC; 2.8-7.5 MC; 4.8-17.5 MC; which includes the 75 and 20 meter bands. 6 tubes: 6BA6 R.F., 6BE6 Mixer, 6BA6 I.F., 6AT6 demod.-1st Audio, 6AQ5 output, 6X5GT rectifier.

Vibrator power supply mounted in metal case with 6" PM speaker, for fire-wall mounting. 3-ft. plug-in cable included.

Receiver only 4½" high, 6½" wide, 6" deep. Mounting hardware, complete manual, fused battery lead, included.

From panel RF gain control, Audio, Band Switch, Tuning.

Here's an excellent mobile receiver at a nice saving. Regular price is \$110. We have just 23 to sell at **\$65.00**. Standard 90-day RTMA warranty.



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Triple 8 mfd, 500 working volt D.C. oil-filled condenser, common negative, solder terminals, hermetically sealed, 5" x 3½" x 2¼". A one-time buy. **\$1.95**

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PR-31 (30-50 Mc, FM) 115V, AC-DC.....	\$44.95
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AK-2 (108-132 Mc, AM) Aircraft band.....	\$49.50
M-31 (30-50 Mc, FM) 6 volt mobile.....	\$72.50
M-101 (152-163 Mc, FM) 6 volt mobile.....	\$72.50

MINIMUM ORDER \$2.00.
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VFO or Crystal control. Direct-reading FVO on all bands—75, 20, 11, 10, 1. • Plate modulation • Completely band-switching, fone or CW. • 50 Watts max. input. Power required: 300-500 V.D.C. at 250 ma., 6.3 V AC or DC at 4.5A. • Uses 3-6AG5, 6AR5, 6C4, 12AU7, 2-6L6G, 807, [included]. • Only 7½" x 7½" x 12" 14½ lbs.

For carbon mike input..... **\$139.00**

For Dynamic or crystal mike..... **\$149.00**

Power Supply, 110 Volt AC..... **\$ 39.50**

ELECTRO-VOICE 210 Mobile Carbon Mike..... **\$ 17.10**

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• Single point tuning: high image rejection, birdies negligible	
• Automatic Noise Limiter—Built In	
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• Antenna Trimmer on Front Panel	
• Beautiful Grey Hammertone Finish	
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• I.F. Amp. with 4 Tuned Circuits, Output 1525 Ke.	
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VESTO CO., Inc.
20th and Clay
North Kansas City, Mo.

The Siamese Paddle

(Continued from page 16)

The paddles are made of pieces of $\frac{1}{8}$ -inch polystyrene or lucite sheet, $2\frac{1}{4}$ inches long and 1 inch wide. A hole to pass a machine screw that fits the knob hole in the key arm is drilled in each paddle, $\frac{1}{2}$ inch from one end. Most key knobs have a standard 8-32 thread. The exact manner of mounting the paddles depends on factors to be discussed presently.

If you can locate a piece of $\frac{1}{2}$ -inch steel or brass, you can add a weighting base with rubber feet like the conventional bug. The base shown is 6 inches long and 3 inches wide. Be sure that the mounting screws on the underside of the bakelite base don't protrude so as to short on the metal base. If the weighting base is omitted, the key can be screwed or cemented to the operating table. Rubber cement sets quickly and yet permits removal without difficulty. Also, it will not mar the finish of an operating table.

Adjustment

The adjustment of the key depends largely on the personal preferences of the operator. I have mine adjusted so that both sets of contacts cannot be closed simultaneously. However, many of those who are using electronic keyers of the self-completing type find possible many short-cuts in the forming of certain characters and increased ease of handling in other ways if it is possible to close both circuits at once when desired. For instance, closing the dot side while dashes are being sent does not interfere with the sending of dashes. Therefore, when both sides are closed, the change-over from dashes to dots can be accomplished merely by opening the dash side. Actually, it is necessary to open the dot side only for spaces.

As shown in the photograph, the paddles are mounted on the inward sides of the key levers, with the heads of the 8-32 screws also on the inside. With this arrangement, it may be necessary to bend the key levers slightly if it is desired to prevent closing both circuits at the same time. Place a thickness or two of paper between the contacts of each key and press the two paddles together between the thumb and forefinger. Then the levers should be bent slightly so that when the paper is pinched securely between both sets of contacts, the heads of the 8-32 screws are in contact.

After the photograph was made, an arrangement making this adjustment more convenient was found. The paddles were placed on the outer side of the key levers and the screws were reversed with the heads on the outside. A locknut was first run onto each screw. Then the screw was passed through the paddle, threaded into the key lever and then fastened with another locknut on the inside. Now the above adjustment can be made simply by adjusting the screws with a screwdriver and locking with the two nuts. I prefer the wider paddle spacing that results with

(Continued on page 116)



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Fellows — NOW is the best time to trade for a new receiver or transmitter. Our stocks are complete — our prices are LOW. I'll give you the best deal on your used equipment. WRL gives you • TAILOR-MADE TERMS • LOWER PRICES • LIBERAL TRADE-INNS • COMPLETE STOCKS • PERSONALIZED SERVICE. You'll benefit most by dealing with WRL, "One Of The World's Largest Distributors Of Amateur Radio Transmitting Equipment."

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"NO TVI with GLOBE KING 400B XMTR"

Sam Brodsky, W4JZQ, 418 E. Colonial Ave., Elizabeth City, N.C., is an enthusiastic WRL GLOBE KING owner who writes the following unsolicited letter:

"There is no TVI generated from the GLOBE KING 400 B which I purchased from you. I can run the XMTR at a full 420 watts and the transmitting antenna is only 8 ft. away from the TV antenna with no TVI filter on my TV set or on the XMTR; just a brute force filter in the AC line. I get no TVI on my TV set."

Signed, Sam Brodsky, W4JZQ

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NEW WRL 400B GLOBE KING XMTR \$475.00 \$495.00

WRL 165 WATT GLOBE CHAMPION XMTR

(less accessories)

KIT FORM WIRED
\$329.50 \$349.50

WRL 40 WATT TROTTER XMTR

More Watts Per Dollar

KIT FORM WIRED
\$89.50 \$99.50

NEW ELMAC-A54 UNDER DASH XMTR Mobile



VFO or Crystal control. Direct-reading. VFO on all bands—75, 20, 11, 10. • Plate modulation. • Completely band-switching, tone or CW. • 50 Watts max. input. Power required: 300-500 V.D.C. at 250 ma. 6.3 V AC or DC at 4.5A. • Uses 3-6AG5, 6ARS, 6CA, 12AU7, 2-6L6G, .807, (included). • Only 7½" x 7½" x 12" 14½ lbs.

For carbon mike input \$139.00
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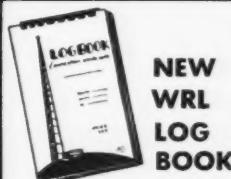
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this arrangement, although others may prefer the closer spacing when the paddles are on the inside. It will usually be possible to use the screwdriver adjustment, even with the paddles on the inside, although it may be necessary to file the nuts down to fit the space between the key levers.

If simultaneous closing of both sides of the circuit is desired, adjustment is merely a matter of setting the contact spacing, bearing play and spring tension to suit the operator, using the adjusting screws already provided on the keys for these purposes. If you have a light touch, it may be necessary to change the springs to lighter ones, or to cut a turn or two off the existing springs and stretch to fit the space.

In the electronic-keyer circuit, the "arm" connection will be made to one of the terminals connected to the frames of the keys, while the two "side"-contact connections will be made to the terminals connected to the straps leading to the stationary contacts. Depending upon how these two "side" contacts are connected, the keyer can be operated either right-handed or left-handed. Simply reversing these connections reverses the operation.

Getting the Most Into Your Antenna

(Continued from page 23)

if you try to use a parallel-tuned coupler in circumstances that call for the use of series tuning, you just won't get maximum performance from your antenna. Selection of the right type involves drawing a sketch of the current distribution on your particular system. This is easier if you get in the habit of thinking in terms of quarter wavelengths at the frequencies you plan to use. For example, a quarter wavelength at 3725 kc. (the center of the present Novice assignment in the 3.5-Mc. band) is 62.8 feet. It is safe to round this off to the nearest whole number, or 63 feet. You know, then, that in whatever system you choose to erect, the distance between the end of the antenna and the first maximum current point is going to be 63 feet. Measure off the flat top and the feed line, and sketch in the current pattern so that you have a drawing that resembles one of those shown in Fig. 1. Indicate the points at which current maxima and minima occur, and when you have reached the end of the line you will have a pretty good idea of what conditions will be encountered there. For example, in sketch C of Fig. 1, if your feed line has to be short, terminating at points AA', you will know that parallel feed is required, because the feed point is at (or near) a current minimum. The same applies if the feeders are a half wavelength longer, ending at DD'. If the feeders can be a half-wave long,

(Continued on page 118)

¹ This computed from the formula

$$I \text{ (feet)} = \frac{468}{f \text{ (Mc.)}}$$

which appears on page 28 of the *A.R.R.L. Antenna Book*.

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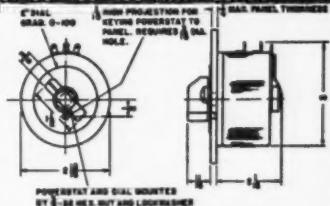
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442 5 x 6 x 4	1.33
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A-3106	2000-20000	220	2000-20000	220/440	125	4 1/2	3 1/4	4 1/2	13.23

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A-3109	PP2A3, 6A3, 6B4, 6L6, 45, 46, 59	6000 c.t. 3800 c.t. 3000 c.t.	5000-8000 10000	80	100	25	3 1/4	2 1/4	2 1/4	5.00
A-3110	PP6L6, 807, RK41, HY56, HY61, HK24	6600-3800 c.t.	4000-5000 7500-10000 12000	175	150	60	4 1/2	3 1/4	3 1/4	8.53
A-3113	PP-800, 809, TZ-40, T-55, HK-54, RK-31, HY-40, 811, 807, 812	15000-6900 c.t.	3000-4000 5000-6000	250	300	175	4 1/2	3 1/4	3 1/4	12.94

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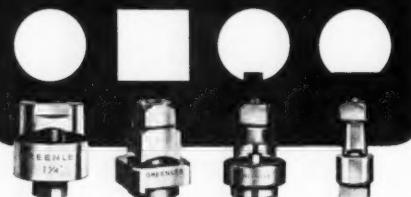
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points BB' , you should expect to use a series-tuned coupler, because the feed point shows a current maximum. If it works out so that the end of the feed line is midway between a current maximum and a current minimum, as shown at points CC' , don't give up the ship; you can still lick your problem. It is sometimes possible to lengthen or shorten the feeders to get away from this intermediate point merely by rearranging the route taken by the feed line on the way into the house. If this is impossible, you can add length right inside the operating room by the simple expedient of adding on a few feet of 300-ohm Twin-Lead.² This is not the best way in the world to do it, but in most cases the power loss in the Twin-Lead will be negligible when compared with the benefits obtained by getting better coupling than you would have been able to obtain without it. In low-power stations (150 watts or less), the Twin-Lead is able to stand the strain admirably. If you prefer to be really efficient about it, refer to the methods shown in the *Antenna Book*,³ but the Twin-Lead dodge will work almost as well.

In the case of the single-wire antenna shown in Fig. 1A, the length is of less importance, because the pi-section coupler can cope with almost any conditions. It is good to know, however, whether you are going to have to feed the end of the wire at a point of high or low current. This can be determined, of course, by drawing the curves as in Fig. 1. If the length of the "single-wire" antenna can be made to come out so that it is resonant at the operating frequency, it will be much easier to get power into it than if it is a random length. Resonant or not, it will probably not do quite as good a job as either the Zepp or the center-fed antenna for the reasons explained earlier. It is, however, usable in emergency conditions and in locations where the use of something better is impossible. In most cases, it is advisable to connect the chassis of a pi-section coupler to a good external ground. This is especially true in cases where the antenna must be less than a quarter wave length long. The ground connection can be to either a cold water pipe in the house or a metal rod driven several feet into the ground just outside the house.

In summary, then, the use of a resonant antenna is suggested, because it is the easiest way to eliminate coupling problems. While a single-wire antenna will work, it is not as apt to radiate the power where it will do the most good. It is better to put up either a Zepp, or a center-fed antenna with a balanced feed line, and of these two, the center-fed is by far the most flexible.

A subsequent article, a direct follow-up of this one, will describe the construction and use of antenna couplers suitable for the Novice, and will provide the bridge between the fundamentals discussed here and their practical application.

² How much Twin-Lead to use depends upon the difference in length between the end of your feeders and the next quarter wavelength point. In cutting the required length of Twin-Lead, multiply the number of feet required to make up the deficiency by 0.82, to compensate for the difference in velocity factor between the open-wire line and Twin-Lead.

³ See the *A.R.R.L. Antenna Book*, page 124.



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MAS596 Capacity 25 mmfd. per sec., .020 spacing, butter				
By type	1 1/4	1 1/4	1 1/4	1.35
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120

Driven Arrays

(Continued from page 81)

db. to an S point. The author's thanks are due to the numerous VK stations who have co-operated in these tests.

Good DX reports have been obtained from all directions on 14 Mc., although the steep slope of the ground makes it impossible to get the angle of radiation just right for all directions. On 28 Mc. reports from W, VE, ZE, ZS and VQ have been very satisfactory in spite of adverse conditions during most of the tests, but certain other directions have proved difficult apparently because of an unsuitable angle of radiation. In this respect the performance should be neither better nor worse than that of other types of beam, and no difficulty should arise with a normal flat site and a height of 40 or 50 feet.

Happenings

(Continued from page 58)

77) The vote having been taken, the result of the ballot was announced by the tellers as follows:

Whole number of votes cast	18
Necessary for election	10
For Mr. Bailey	7
For Mr. Dosland	11

Mr. Dosland, having received the majority of the votes cast, was thereupon declared by the tellers to be elected President of the League for a term of two years. The Chair congratulated Mr. Dosland upon his election. (Applause) Mr. Dosland spoke briefly in appreciation. (Applause)

78) On motion of Mr. Groves, a unanimous standing vote of applause was given to Mr. Bailey in appreciation of his service to the Board and the League.

79) Nominations for First Vice President being in order, Mr. Roberts nominated Mr. Groves. Mr. Johnston nominated Mr. Noble. Whereupon, on motion of Mr. Jacobs, unanimously VOTED that the nominations are closed.

80) The vote having been taken, the result of the ballot was announced by the tellers as follows:

Whole number of votes cast	18
Necessary for election	10
For Mr. Groves	11
For Mr. Noble	7

Mr. Groves, having received the majority of the votes cast, was thereupon declared by the tellers to be re-elected First Vice President of the League for a term of two years. (Applause)

81) Nominations for Vice President being in order, Mr. Noble nominated Mr. Handy. Whereupon, on motion of Mr. Reid, unanimously VOTED that the nominations are closed and that the Secretary be instructed to cast one ballot electing Mr. Handy Vice President of the League for a term of two years.

82) Nominations for Secretary being in order, Mr. Dosland nominated Mr. Budlong. Whereupon, on motion of Mr. Brabb, unanimously VOTED that the nominations are closed and the Secretary is instructed to cast one ballot electing Mr. Budlong as Secretary of the League for a term of two years.

83) Nominations for Treasurer being in order, Mr. Griggs nominated Mr. Houghton. Whereupon, on motion of Mr. Roberts, unanimously VOTED that the nominations are closed and that the Secretary is instructed to cast one ballot electing Mr. Houghton as Treasurer of the League for a term of two years.

84) Mr. Griggs reported orally for the Membership and Publications Committee, following which extensive discussion ensued. On motion of Mr. Roberts, unanimously VOTED that the Board wishes to express its satisfaction to the League's management for its effort in the membership campaign enunciated as a result of the 1951 Board meeting

(Continued on page 122)



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This is a picture of the TS-174 Hetrodyne frequency meter. It looks exactly like a BC-221 but covers a higher frequency. We have defense orders we can not fill for lack of this item. If you know anyone who has a TS-174 or have one yourself, please sell it to us or exchange it for new ham gear of your choice. Write, wire or phone.

and that it is expected that this campaign will be continued and intensified in all phases in which success has been indicated.

85) During the course of the above action the Chair announced that with the concurrence of the new President-elect, the following committee appointments are made for the coming year:

For the Finance Committee:

Mr. Noble, Chairman
Mr. Hill
Mr. Hughes

For the Planning Committee:

Mr. Brabb, Chairman
Mr. Grove
Mr. Johnston

86) On motion of Mr. Hill, unanimously VOTED, after discussion, that all divisions of the League which exceeded the national average in membership increase during 1951 are commended.

87) On motion of Mr. Watkins, unanimously VOTED that the Membership and Publications Committee be retained for one year to aid and direct the Headquarters staff in implementing and conducting the membership campaign previously authorized by the Board.

88) On motion of Mr. Roberts, unanimously VOTED that, pursuant to the terms of the Trust Agreement under the Pension Plan, the following persons are appointed to serve as a Pension Committee from this date until June 2, 1953: Arthur L. Budlong, George Grammer, David H. Houghton.

89) Moved, by Mr. Brabb, that, pursuant to Article 7 of the Amended Articles of Association, the Board now appoints three directors to the Executive Committee. But, after discussion, with the permission of his second, Mr. Brabb withdrew the motion.

90) On motion of Mr. Brabb, unanimously VOTED the Board now proceed to the designation of an additional director to the Executive Committee as required under the terms of Article 7 of the Amended Articles of Association. Whereupon, on motion of Mr. Hill, the Board unanimously VOTED to designate Mr. Noble as a member of the Executive Committee.

91) At this point, at 12:40 P.M., upon request of the Board, the Chair directed that all Headquarters staff personnel retire from the meeting; at 1:10 P.M., at the request of the Board, they rejoined the meeting.

92) On motion of Mr. Reid, the following resolution was ADOPTED:

WHEREAS, the position of General Manager of the League has for a period in excess of five years been a position to which a salary of fifteen thousand dollars (\$15,000) per annum was attached; and Whereas the Board has from year to year heretofore employed Arthur L. Budlong to fill that position on a temporary salary somewhat less than that ascribed to the position;

Now, be it RESOLVED, that effective May 1, 1952 the salary to be paid Mr. Budlong is to be that prescribed for the position of General Manager, viz., fifteen thousand dollars (\$15,000) per annum.

93) At this point, Mr. Hughes invited directors to attend the Pacific Division Convention which is to be held in San Francisco the weekend of July 4, 1952. Mr. Griggs similarly invited members of the Board and the Headquarters staff to attend the Southwestern Division Convention at San Diego the weekend of October 11, 1952.

94) Whereupon, on motion of Mr. Johnston, the Board adjourned *sine die* at 1:17 P.M.

95) In the course of its deliberations the Board also discussed, without formal action, 1800-2000 kc. privileges and suballocations, the Canadian reciprocal licensing treaty, 21-Mc. TVI, mailing of Director Letters to retiring directors, amateur traffic nets, Canadian suballocations, IARU band planning, engineering standards for amateurs, policy on use of director administrative funds, coordination of TVI committee efforts, ARRL membership and amateur license figures, and the new Novice promotional booklet. Time in session, as a Board: 9 hours, 41 minutes. As a Committee of the Whole: 3 hours, 3 minutes. Total time in session, 12 hours, 44 minutes. Total expenditures authorized, \$18,050.)

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YL News and Views

(Continued from page 39)

operators. Both YLs obtained their tickets through classes held at the hospital. . . . W3RXV and W5RZJ recently received their MARS calls and W8HDB regularly operates the MARS station at Wright-Patterson Air Force Base in Dayton. . . . WN4UDQ, Dorothy, is a new Novice in Tennessee, and KZ5KA, Catherine, is a new Canal Zone YL. . . . Anita, ex-W8TAY and now W4JCR, is living on the highest mountain around Asheville, N. C. She's hoping the elevation will help her contact many of her old YL friends. . . . OM G3FPK amends that of approximately 7000 amateurs in England, only about 20 are members of the fair sex. . . . W1FTJ, member of the Concord Brass-pounders and custodian of the Worked New Hampshire



Four Canadian YLs who help keep YL activity thriving in VE-land are VE3DEX, Violet (lower left), who concentrates on 80 c.w. and builds most of her own gear; VE3BGG, Marie (lower right), who also likes 80; VE3DTW, Ethel (upper left), who, with the OM, operates 10 and 2 from the Port Willer Lighthouse on Lake Ontario; and VE3DGT, Margaret (upper right), who is at home on all bands from 80 through 10 meters.

Certificates, reports that Dottie, W3JSH (Coroopolis, Pa.), was the only YL to work all N. H. counties in the WNH QSO Party. . . . The L. A. YLRC gave a shower for W6WSV, the Club's Publicity Chairman, three weeks before Carol's new son arrived. . . . W6s BLI FEA GEV GQZ HHD MWU PJF QVK ZKD ZYD and W4KZT attended the Fresno Radio Club's annual hamfest in May. . . . Since receiving her license in 1938, WSSKZ has spent most of her operating time on forty. . . . Judy Volpe, age nine, daughter of W1LEL, passed the Novice Class examination and is awaiting her call. . . . W8GJP, who planned entertainment for XYLs at the "Ham-Vention" sponsored by the Dayton Amateur Radio Assn., reports that the following YLs enjoyed ham doing at the affair: W3UUG, W8 FYT GJP HDB HUX HWX JLP RVP and W9s ILH JUJ and QLH. . . . While touring Europe this spring, W6UXF enjoyed the hospitality of G3ACC, Meg, and G2YL, Nell. . . . We are sorry to record the passing of W6SLT, Edna McGeorge of Los Gatos, California. Edna was an active YL until the onset of serious illness two years ago.

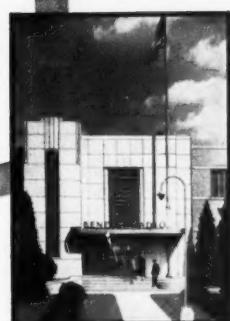
Miscellany

The YLRL Photograph Album and Club Scrapbook are available for display at YL meetings and gatherings. If either or both books are desired, please write to YLRL Publicity Chairman, W1QON.

Wonder how many YLs have passed the Extra Class exam? We'd like to hear from those who have made the grade. Any "grandmother-class" girls among us?

In response to many requests for the information, we'd like to ask how many teen-age or younger YLs there are the world over. YLs sixteen or under, do drop us a card, so we'll know who you are and approximately how many of you there are.

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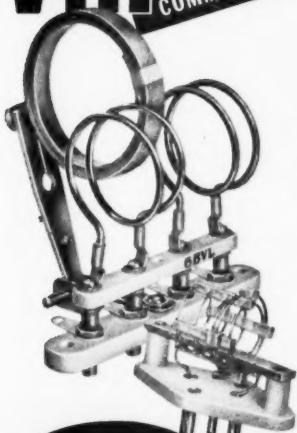
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Mast Loading and Guying

(Continued from page 44)

a few days in advance by several alternate layers of roofing compound and impregnated burlap or cloth commonly used for roof patching.

Resonances

Any flexible structure is subject to "resonances," which must be classified under "undetermined" factors. The values given in Tables I and II are based on ample factors of safety, and no resonances should be encountered.

Resonances can be damaging, but frequently they can be overcome by various changes that will change the natural frequency — after the source is located — including:

1. Moving guy points on the mast.

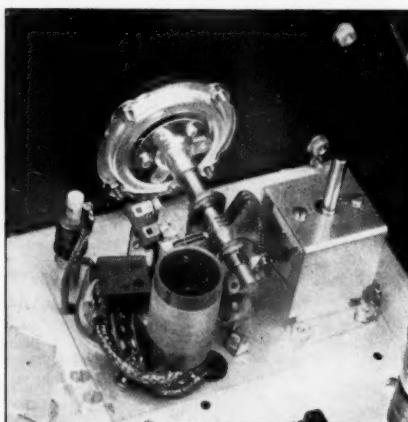
2. Damping the vibrations by wrapping the mast with heavy tape at two or three points along its length, or by plugging the ends with wood dowels 1½ to 3 feet long.

3. Cushioning the base of the mast with an 8-by 24-by 2-inch creosoted wood block (cypress or redwood preferred), laid over 6 inches of cinders or sand, and grounding the base of the mast electrically with a wire and ground rod.

160-Meter Rig

(Continued from page 60)

increased slowly while checking the stability. For normal operation at maximum legal input, the screen voltage is raised to 350 and the plate



A view of the VFO section with the cover removed. The inverted 6AG7 socket is just to the left of the tuning condenser. RFC₁ is to the front of the 6AG7 socket, the shielded wire connected to the choke is the keying lead. The grid coil is mounted on a half-inch cone insulator. The padder condenser is mounted on a "U"-shaped bracket to the right of the tuning condenser.

voltage to 1200 or 1250. The coupling to the antenna or load can then be adjusted to bring the power input up to 200 watts.

As mentioned previously, the rig works quite

(Continued on page 128)

PREVIEW ANNOUNCEMENT

The NEW GONSET 2-METER TRANSMITTER-RECEIVER

Another GONSET first, answering the need for a complete two meter fixed-portable unit, the new GONSET 2-METER TRANSMITTER-RECEIVER provides an ideal unit for home, mobile and portable use.

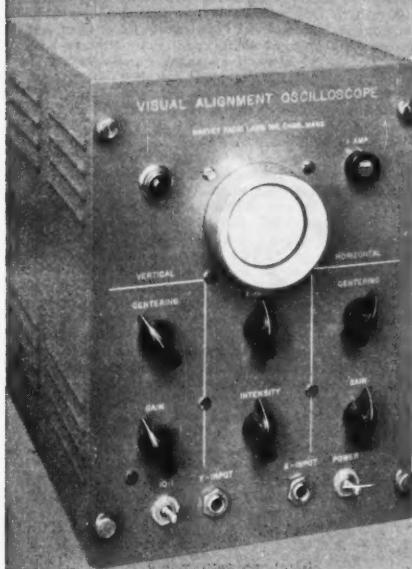
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This transmitter has been in almost constant use since it was built and I have been highly pleased with the results and the reports.

ARRL Articles - By-Laws

(Continued from page 59)

responsible for the general supervision of the affiliated societies and their welfare, and for the relations existing with them; he shall keep the records and conduct the correspondence with them.

7. These Rules and Regulations shall have the force and effect of By-Laws of the League. They may be amended as necessary from time to time by the Executive Committee. Amendments or revisions shall become effective as of the date of their publication in "QST".

RULES AND REGULATIONS OF THE COMMUNICATIONS DEPARTMENT

(Rules and Regulations of the Communications Department are now in preparation.)

How's DX?

(Continued from page 67)

in TKX! . . . AC3PT, the Maharaj Kumar of Sikkim, fills a 40-meter zepp with 60 watts from a 6L6-807 rig. He receives with an AR88. Located in The Palace, Gangtok, the Maharaj writes an enthusiastic letter to W1BDI about conditions and the like. He looks forward to working W/VEs as conditions improve. . . . W2TXB's experiences on the QSL front go like this: "Last year . . . I sent out 211 QSLs to which 72 did not reply, 33 per cent. I sent 106 direct by air mail or regular mail and 31 failed to reply. Of 105 sent via QSL bureaus, 41 did not reply. I would like to take off my hat to the VP8s — worked 4 of these and each one in a different country; all came through with cards." . . . VP5BN of Jamaica takes time out every six weeks to clean up all QSL debts. He ships 'em out via bureaus and all incoming cards are answered. Those interested in direct replies or replies via air mail must accommodate with IRCs . . . F7AS (W6KEN) accompanied F7BB to Monaco as 3A2AQ. The station was on the air for four days in late April with a 50-watt, an HRO and a V beam oriented U.S.A.-ward. There was A3 operation on 20 and 40, c.w. on 20, 40 and 80. While conditions for W/VEs were extremely odorous, a long list of contacts accumulated. Jim remarked on the excellent welcome and hospitality put forth by 3A2 officialdom. Andorra is next on F7BB's agenda. . . . MI3ZX reports the bands poor in general and heard that AP7IR (IIIR) will operate from a spot very close to Tibet. Also, that VQ3PBD will operate as VQ1PBD immediately if not sooner. The MI3US gang is curious about one BK2HY "in Antarctica" and 6AA4AA. [The latter sounds like a refugee from a tube socket, Boss. — *Jeeres*.] . . . GM3CSM was to meet W6s AM and MA at the Prestwick airport on the first leg of the Wallaces' European tour . . . One-hundred-twenty-five EA QSOs (with at least three for each of the nine EA call areas!) will qualify you for the *Espana Diploma* offered by URE. Write the society for complete details. . . . Twelve Ws have earned the "Worked Cuba" award sponsored by ARALV. Seven QSL cards confirming contact with each of the seven geographical CM/CO call areas (CM1 through CMS, excluding CM4) will do the trick. . . . "4X4 = 16" is the title of an award presented by IARC of Israel. QSLs verifying sixteen QSOs with 4X4s on four amateur bands

(Continued on page 180)



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The shield encompassing the transmitter chassis fits inside the standard Viking 1 cabinet without affecting its appearance or operation. Perforated etched aluminum shield panels are formed and punched, ready for assembly. The lid of the shield is removable for ready access to tubes and crystals. Completing the shielding are: an aluminum chassis bottom plate, meter shield and shield for the dial aperture. Assembly is by means of thread cutting screws furnished.

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Equipped with the TVI SUPPRESSION KIT, installed in accordance with instructions furnished, a JOHNSON LOW PASS FILTER and an effective ground, it is possible to operate the VIKING 1 transmitter in virtually any location without television interference.

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are required. Write IARC for the pitch in detail. . . . KX6AO (ex-KH6VB-KM6AO) is looking for Novices on 11 meters. Chuck has a BC-610, a 3-element rotary on 10 meters and a Sterba on 20. He finds the latter band consistently good in the late Keweenaw evenings. . . . Some choice squibs from W5KUC's West Gulf DX Bulletin: KP4ZK is ex-2FB of 1912. . . ZL1HY may put the ZM7 prefix to work on Union Island. . . W3GRF paid a personal visit to G2ML. . . The West Gulf DX Club held a bang-up meeting in Shreveport where an election of officers installed W5KUC president, W5CEW veep, W5UCQ secretary and W5FXN treasurer. Chosen for the club policy committee were W5ASG EGR ENE KC and MIS, to work with W5KUC and CEW. . . "Juice" notes: It's Rio de Oro for EA8AW around September. Lately available are FL8MY, 4W1MY, VR4AF, VR7AB (Nauru), FO7AW and KC6QL (Truk). Good luck!

W1RWS pulled the QSL-of-the-Month from his office mailbag. It's an IIYAK card confirming a 14-Mc. 'phone QSO with W4OSU.

Correspondence

(Continued from page 89)

NOVICES SPEAK UP

1338 Washtenaw
Ann Arbor, Mich.

Editor, QST:

I deplore the trend in radio magazines in general that treat the Novice as a rank newcomer to radio theory. Most Novices I am sure are well up on their theory — they just can't send or copy the code fast enough!!!

— Jerome S. Miller

Kellogg Star Route
Oakland, Ore.

Editor, QST:

I do not know if this matter has been called to the attention of all radio amateurs or not, but the fact that there are so many high-power transmitters operating in the Novice band of 3700-3750 kc. limits my hobby to the more quiet hours. I am sure that I speak for many Novices running low power that would like to operate when that band is at its best. We all can take QRM in our stride — but I am sure there is a solution to this problem.

— John R. Barrett, WN7PXS

PUBLIC SERVICE

c/o U. S. Veterans Hosp.
San Fernando, Calif.

Editor, QST:

With some time on my hands at present I have been trying to settle in my own mind my place in the scramble by various agencies for hams to operate civil defense and/or disaster relief stations.

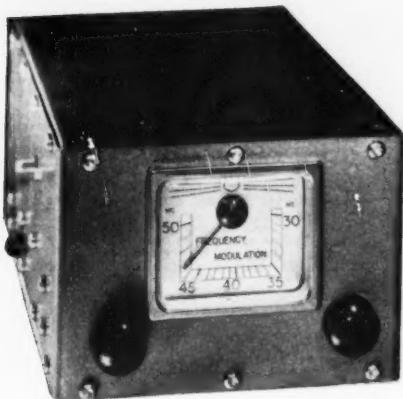
I hear and read about CAP, MARS, AREC, and here in California the Defense and Security Corps (National Guard Reserve), all trying to recruit hams. Each has a set of assigned frequencies, call letters, procedures and network of stations. In addition, competition seems to exist as to who arrives first or is best organized.

What confuses me is this: Where do I stand? Is the ham to join a quasi-service organization in order to most fully utilize his potentialities or should he affiliate with all and juggle call letters, etc., as he meets with the many varied services.

— Arnold D. Senterfit, W6ESV

[EDITOR'S NOTE: Coöordination and coöperation with non-amateur agencies and organizations, especially the military, civil defense and the Red Cross, are of paramount importance. We believe this can best be accomplished not necessarily by individual-amateur participation in one to the exclusion of others, but through the medium of the amateur service's own emergency organization, the Amateur Radio Emergency Corps (AREC), which works with and for all agencies to the degree public need and service require.]

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WOULD like help from local operator on code and theory. R. Caro, 20 Orchard St., Wellesley 81, Mass.

FOR Sale: Hallicrafters SX 28A, like new, \$200.00. Two complete Abbott TR-4 2-meter receiver-transmitters with power supplies and microphones, only \$60 for both. Peck, W201F, 204 Perrine Ave., Auburn, N. Y.

SELL: 400 watt fone xmitter in excellent condx. Includes Class B modulator, VFO, full power supplies, furniture cabinet, etc. Navy officer wished to sell because of constant movement. Freight prepaid from San Francisco, E. S. Pratt, 315 Jefferson Terrace, East Point, Georgia.

HALLICRAFTERS S-72 portable rver, used only slightly, new condx, \$75. Save \$15.00. Lettine 240 wid coils for 4 bands and 2 xtais, \$70.00. No trades. All letters will be answered. Blum, 2661 Dibblee Ave., Columbus 4, Ohio.

SELLING complete National Schools Radio Television Electronics course. First \$50.00, Fox, Box 4143, College Station, Texas.

NOW need following: **Amateur Radio Book**: 1949 Winter Fall; 1958 Summer; 1958 Winter; 1958 Summer; 1954 Winter Fall; 1952 Winter; Summer; Fall; 1950 Spring; Summer; 1929 Spring; 1928 all four copies 1927; Spring; Summer; 1926 Winter; Spring; Summer; 1925 any copy; 1924 Winter; Summer; Fall; 1923; Summer; Fall; 1922; Spring; Summer; Fall; Also U. S. Govt. Printing Office Edition "Commercial Stations" 1922, '23, '26; "Amateur Stations" 1925, '26; "Year Book of Radio Engineering, Photography & Telephony, Marconograph Magazine, Blue Book List of Calls, OST 1915-20, ARRL List Member Stations. Bob Willits, WIPN, Box 26, Hyannis, Mass.

ATTENTION Novices! NC-57 in A-1 condition. Have to sell. First \$75 takes this fine recvr. Would prefer a local deal. Spencer Miller III, WIVNN, 259 Longmeadow St., Longmeadow, Mass.

NOVICE transmitter for sale. Hallicrafters 17-17, brand new, complete with all coils, \$80-10, \$50. Also large list of tubes, parts, etc. New York City. Phone Sedgwick 3-3690, W2ENP.

WILL: Trade: New Clough Brengle Model 245A capacity and resistance bridge, with other features. New Solar Model CF-V.T.V.M. capacity and resistance bridge, with quick condenser check. Both sell for \$250. Will trade for 16" TV in good condx. George Kasik, W9NSA, Box 69, Fox River, Grove, Ill.

KILOWATT transmitter, 10 and 75 meters. In good condition. \$450 cash or reasonable trade. Full description and details on request. W4JHZ, 8230 Division Ave., Birmingham, Alabama.

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SELL: Electronic "Mon-Key" and a "Speed-X" automatic key. R. Harrison, W8FYV, 310 Washington, Barnevile, Ohio.

SELL: BC-221 for \$75.00; 2-100TH's for \$10.00; 2-VT127A's for \$5.00. F.o.b. No C.o.d.'s. W4IPS, P.O. Box 236, Vienna, Va.

OSL and SWL cards. Samples. W7PVZ, Jacobs, Johnson's Point, Olympia, Wash.

SELLING estate of late Joe Crabhill, W1PCC. Selling ham gear including 2-240D, PE VHF152A, \$200.00 for both. Also 250-watt xmitter, BC-344A, PE 103A, etc. List on request to W1QKE, 109 Glenwood Street, Lowell, Mass.

QSL Cards, \$1.95 and up. Atlantic Press, Clifton, N. J.

SELL: Bendix TA-12 100-watt transmitter and power supply. Bandswitching, VFO on 80-40-20; \$100.00. Hallicrafters S-38, \$30. W6PBE, Box 3696, Carmel, Calif.

SELL: Teletype equipment, panoramic adaptor, BC-221 freq. meter, 250TH, LM freq. meter with modulation. Want: PE-217, GN-58, BC-136, APS-J cables. Technical manuals. T. Clark Howard, WIAFN, 44 Mt. Vernon St., Boston 8, Mass.

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WANTED: BC-221 in good condition, 304TL's, W2HWK, Box 199, R.R. 43, Nixon, N. J.

HARRISON'S QSL's. Samples for \$4. 8001 Piney Branch Road, Silver Spring, Md.

QST back issues, 1933 thru 1940. List. Herbert Johnson, P. O. Box 151, Rifton, N. Y.

NEW VHF152A, \$69.95, used DB22A, \$49.95, SX-25 with speaker, \$100.00; Welco 50-watt all-band phone xmitter, \$95.00; with VFO, \$110.00, perfect; Collins 32V1, \$465.00. W6KU, 5615 Anthonia Ave., Arvada, Col.

USED tubes: 833's, \$5.00; 843's, 50¢; 902's, \$1.25; 872, \$1.00; 845's, \$2.00; 805's, \$2.00. Curtis, W5AQG, Longview, Texas.

WANTED: Late model Globe King transmitter. Best offer takes large, unused, unconverted prop-pitch motor. H. F. Cushing, WIEUS, 16 Preston Drive, Manchester, Conn.

TRADE: For gun or outboard motor. Complete station, 30w, 10 m. phone/cwt, with 1000 ohm dipole, radio, mike, key, spare tubes. Rovac AC BC224H, with BC noise limiter, crystal converter for 10 m. speaker, phones. Also MP23 base & 30 ft. steel vertical, etc. Write WSSPS, Box 1320, Bryan AFB, Bryan, Texas.

SELL new Meissner 250-watt modulator and speech amplifier with tubes and power supply on one chassis, factory-wired. Photo. Want reasonable cash offer. R. Long, 184 L Street, South Boston, Mass.

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DELUXE 813 TVI-proof AM/CW transmitter (See 1952 Handbook), \$514.00. 350 watts. VFO and modulation monitor. Pre-set to 10. In 35' coaxial cable with center conductor. Square tubes and coaxial antenna required. Best offer around \$400.00 or complete with new 75A2 rver \$75.00. W2TLG, 68 Vernon Ave., Rockville Centre, N. Y.

SOS! Who will lend me schematic for Patterson PR-15 receiver? Will photostat and return promptly. John P. Ramsey, W1UJG, 81 Spring Street, Hamden, Conn.

CLEANING house: Elmac 304TL, new, \$5.00; Gammatron VT127A, new, \$25.00; used, \$1.50; (2) 6J4's, slightly used, \$2.50 each; Johnson 100DD70 condenser, slightly used, \$7.00; 100DD70, \$6.00; Mod. 8012A, \$8.00; 8012B, \$8.00; 8012C, \$7.50; 8012M, \$6.00; new condx, \$6.50; Sangamo G2 mica Cond., 0.039 8000 volts, new, \$6.00; Triolite, 3/4" round 0-200 microammeter, new condition, \$6.00; PE 101C, new, \$7.50. W7TJF, Box 9, Bricelyn, Minnesota.

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COLLINS 32V2 wanted. W9JKC, P. O. Box 266, 695 Vernon Avenue, Glencoe, Illinois.

TRADE: Have BC-654 Air King wire recorder. Motorola 34 mc fm police transmitter with Carter genemotor, receiver and speaker, separate Carter 600 v. generator. Want: 10-20-75 Mobile transmitter and converter. Graham H. Hicks, W51HP, Box 364, Natchez, Mississippi.

FOR Sale: NC-183 with speaker, new, in original cartons. Price: \$175.00. C. W. Ehlers, 319 Union Street, Jersey City 4, N. J.

COLLINS 302-K transmitter for sale. Filtered and screened, 4-250A final, 500 watts phone. Stainless base. Box 789, Anderson, Indiana.

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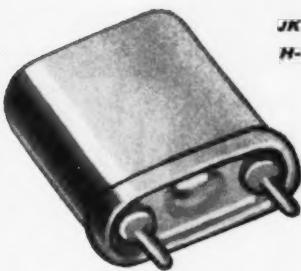
Index of Advertisers

Akers Co., Dallas C.	104
Allied Radio Corporation	97
A.R.R.L. License Manual	96
QST	105
Calculators	106
Binders	131
Ashe Radio Company, Walter	101
Astatic Corporation, The	112
Barker & Williamson, Inc.	125, 136
Belden Manufacturing Co.	87
Bendix Radio Division	110, 125
Brush Development Company	88
Candler System Company	128
Capitol Radio Eng. Institute	94
Chicago Transformer Company	79
Collins Radio Company	2, 114, 116
Commercial Radio Institute	120
Concord Radio	121
Communication Products Company	128
Dow-Key Company, Inc.	116
Eitel-McCullough, Inc.	85
Eldico of New York, Inc.	123, 124, 126, 128
Electro-Voice, Inc.	81
Engineering Associates	126
Evans Radio	128
Fort Orange Radio Distrib. Company	119
Gardiner & Company	123
Gates Radio Company	89
General Electric Company	1
Gosset Company, The	127
Greenlee Tool Co., The	118
Hallcrafters Co., The	4, 5
Hammarlund Manufacturing Co.	91
Harrison Radio Corp.	103
Hartley Manufacturing Company	102
Harvey Radio Company	109
Harvey-Wells Electronics	86
Heath Company, The	123
Henry Radio Stores	107
Hudson Radio & Television Corp.	100
Hy-Lite Antennae, Inc.	108
Instructograph Company	126
Johnson Company, E. F.	112, 129
Knights Company, The James	115
Leeds Radio Company	117
Lettine Radio Manufacturing Company	110
Mallory & Company, P. R.	83
Marinax Electronics	95
Marconi Radio Telec. School	122
Merit Transformer Corporation	92
Millen Mfg. Co., Inc., The James	134
Motorola, Inc.	124
National Co., Inc.	Cov. III, 77, 93, 130
Northrop Aircraft	120
Petersen Radio Company	7
Port Arthur College	106
Precision Apparatus Company	82
Premax Products Co.	129
Radio Apparatus Corporation	131
Radio Corporation of America	Cov. IV
Radio Shack Corporation, The	127
Radio Wire Television	111
Raytheon Manufacturing Company	90
RCA Institutes, Inc., John F.	124
Rider Publisher, Inc.	124
Sperry Gyroscope Co.	126
Steinberg's, Inc.	113
Suburban Radio Company	105
Terminal Radio Corporation	99
Triplette Elec. Instrument Co.	84
U.H.F. Resonator Company	118
United Transformer Company	Cov. II
Valparaiso Technical Institute	123
Vesto Company, Inc.	114
Vibroplex Co., The	120
Weller Electric Corporation	104
Westinghouse Electric Corporation	98
Weston Laboratories	122
Wind Tunnel Company	122
Wood, M. E.	122
World Radio Laboratories, Inc.	115



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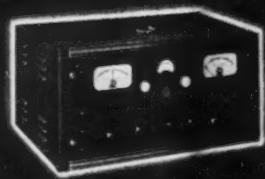


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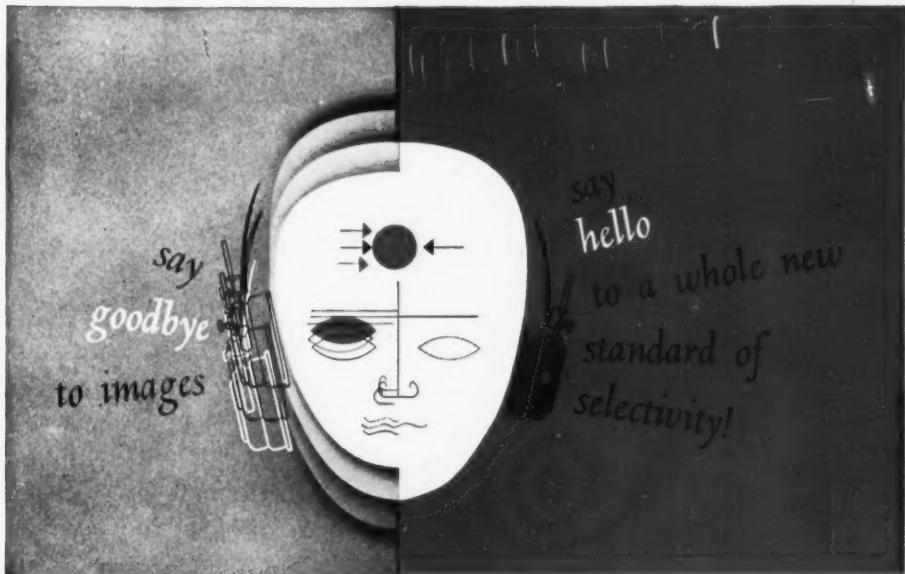


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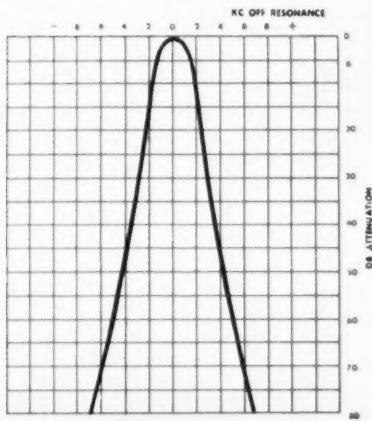
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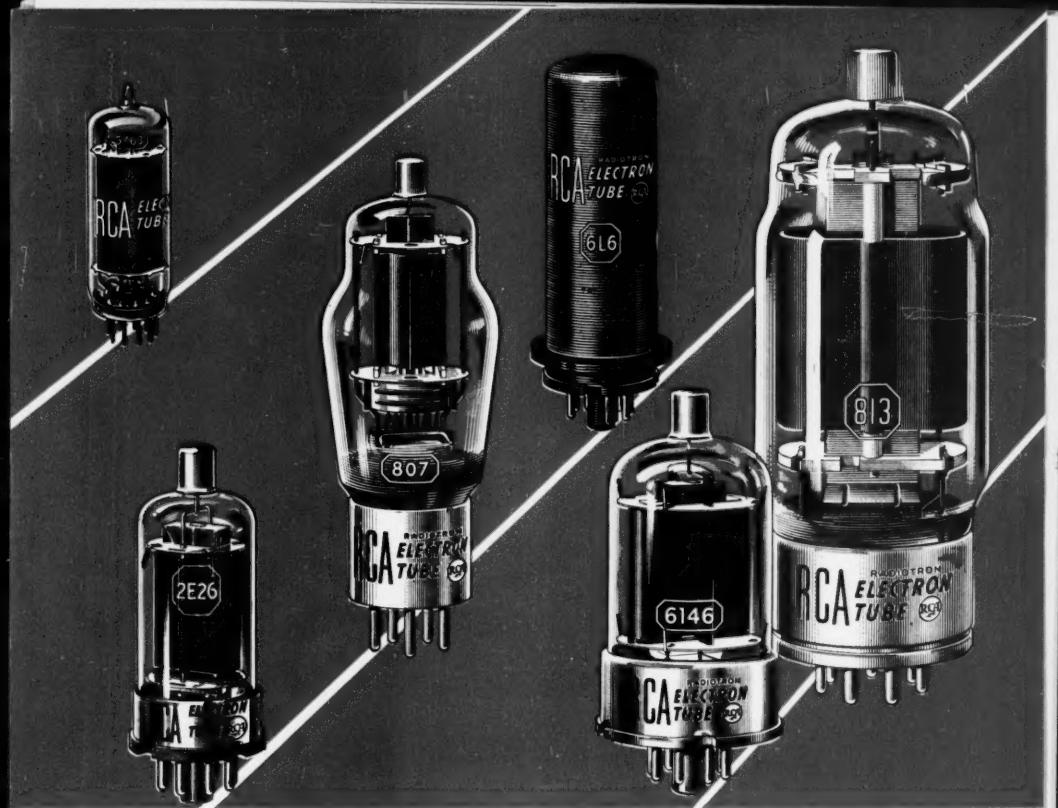


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